

RADIO *AMATEUR*

MAY 1993
Volume 61 No 5



Journal of the Wireless Institute of Australia



- Fox Hunt
Super Sniffer
- Mount
Gambier
- ICOM IC-R72
Review

YOU'D EXPECT A WORLD LEADER IN COMPACT COMMUNICATIONS TO HAVE AN IMPRESSIVE TRACK RECORD

COMPACT TH-78A DUAL BAND TRANCEIVER

The TH-78A (144MHz/430MHz) sets exciting new standards for portable communication combining simplicity of operation with a multiplicity of sophisticated features. It is an innovative Dual Band Tranceiver ergonomically designed to meet the demands of the Amateur Radio world. Alphanumeric memory, multiple scan modes, DTSS and pager functions, dual-frequency receiver and multi-function memory channels are among the features found in this trendsetter.

Pete Jack



New wave technology
in every sense -
Kenwood is the
definitive way to keep
in touch when you're
at sea.



Pure as the driven
snow - that's the
sound quality you'll
enjoy when you use
Kenwood on cross
country skiing trips.



Peak performance -
thanks to the
rugged reliability of
Kenwood.



KENWOOD

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD. (A.C.N. 001 499 074)

P.O. Box 504, 8 Figue Drive, Australia Centre, Homebush, N.S.W. 2140, Australia. TEL: (02) 746 1519 FAX: (02) 746 1509

N.S.W. Argent Communications Blacktown (02) 671 3333, DX Engineering Port Macquarie (065) 849 922, Emron Electronics Sydney (02) 211 0988, F&B Amateur Electronics Balina (066) 867 204, Lake Macquarie Communications Cardiff (049) 567 255, Macalec Pty Ltd Wollongong (042) 291 455, Reg Stockman Communications Inverell (067) 221 303, Action Communications Ringwood (047) 384 797, **A.C.T.** Alex Johnson Aranda (06) 251 4020, **QLD** Emron Electronics Stones Corner (07) 394 2555, Mitchell Radio Co Albion (07) 357 6830, **VIC** Bairdsdale Communications Barmdale (051) 524 622, Emron Electronics Melbourne (03) 370 0330, Just Communications Midham (03) 873 4142, Measure Tech Supplies Dingley (03) 558 0566, Wecam Wendouree (053) 392 808, Stewart Electronics Components Huntingdale (03) 543 3733, **S.A.** International Comms Systems Port Adelaide (08) 473 688, **W.A.** Emron Electronics Victoria Park (08) 470 1118, Ford Electronics Osborne Park (09) 242 1766, Leda Electronics St James (09) 361 762, **TAS** Elgin Pty Ltd Launceston (003) 312 711, Elgin Pty Ltd Hobart (002) 344 500.

FOR AMATEUR RADIO USE ONLY



Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

EDITORIAL GROUP

Publisher

Bill Roper VK3ARZ

Editor

Bill Rice VK3ABP

Production Editor

Bruce Bathols VK3UV

Senior Technical Editor

Peter Gibson VK3AZL

Technical Editors

Evan Jarman VK3ANI

Gil Sones VK3AUI

Bob Tait VK3UI

Marketing

Norm Eyres VK3ZEP

Bruce Kendall VK3WL

Contributing Editor

Ron Fisher VK3OM

ASSOCIATE TECHNICAL EDITORS

David Brownsey VK4AFA

Don Graham VK6HK

Peter O'Connor VK4KIP

Phil Steen VK4APA

Roy Watkins VK6XV

PROOF READERS

Allan Doble VK3AMD

Jim Payne VK3AZT

Graham Thornton VK3IY

John Tutton VK3ZC

DRAFTING

Vicki Griffin VK3BNK

ADVERTISING

Brenda Edmonds VK3KT

June Fox

CIRCULATION

Chris Russell VK3LCR

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:

Amateur Radio

PO Box 300

Caulfield South VIC 3162

REGISTERED OFFICE

3/105 Hawthorn Road

Caulfield North VIC 3161

Telephone: (03) 528 5962

Fax: (03) 523 8191

Business Hours: 9.30 am to 3 pm weekdays

Deadlines Editorial Hamads

June 10/5/93 12/5/93

July 7/6/93 9/6/93

August 12/7/93 14/7/93

Delivery of AR: if this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

© Wireless Institute of Australia 1993

CONTENTS

Technical

VK3MZ Super Sniffer.....	4
Ian Stirling VK3MZ	
Equipment Review —	
The ICOM IC R-72 All Mode HF Communications Receiver.....	11
Ron Fisher VK3OM	
AR Single Coil Z Match — Part 2	14
Lloyd Butler VK5BR	
HFC Regulated Variable Voltage Power Supply.....	19
Drew Diamond VK3XU	
Monitoring RF Currents.....	23
Robert McGregor VK3XZ	
Down to Earth Antenna	24
Robert McGregor VK3XZ	
Random Radiators.....	26
Ron Cook VK3AFW, and Ron Fisher VK3OM	
Technical Abstracts.....	32
Gil Sones VK3AUI	
A Packet of Packet.....	33
Kevin Olds VK1OK	

General

A Postcard from Mount Gambier.....	8
Ivan Huser VK5QV	
The Origin of "HAMS".....	53
Bill Yates VK3SB	

Operating

Awards	
The Outback Award.....	45
Rev John Flynn Award.....	45
Lithuanian Awards.....	45
Contests	
— 1993 WIA VK Novice Contest.....	43
— RSGB Field Day.....	43
— ANARTS WW DX RTTY.....	43
— VK/ZL/P29 80 m Sprint.....	43
— ARRL Field Day.....	43
— ARDF Region 3 Contest Beijing.....	44
Contests Results	
— 1992 RSGB 21/28 MHz SSB Contest.....	43
— VHF-UHF Field Day 1993.....	44

Columns

Advertisers Index.....	56	Morseword 74.....	55
ALARA.....	49	Morseword 74 — Solution.....	56
AMSAT Australia.....	39	Over To You.....	49
Club Corner.....	44	Pounding Brass.....	48
Divisional Notes.....		QSLs.....	42
Forward Bias, VK2 Notes.....	40	Repeater Link.....	35
VK3 Notes, 5/8 Wave.....	40	Silent Keys.....	53
Education Notes.....	38	Spotlight on SWLING.....	50
Federal QSP.....	2	Stolen Equipment.....	48
FTAC Notes.....	47	VHF/UHF An Expanding World.....	41
Hamads.....	54	WIA News.....	7, 10, 13, 17, 22, 30
HF Predictions.....	51	WIA — Divisional Directory.....	3
How's DX?.....	36	WIA — Federal Directory.....	2
IARUMS.....	46	WICEN.....	39

Cover

Ron Cocker VK6FD has supplied this impressive view of his 2 element tri-band quad taken one winter afternoon.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society Founded 1910

Representing the Australian Amateur Radio Service

Member of the International Amateur Radio Union

Registered Federal office of the WIA:

3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:

PO Box 300, Caulfield South, Vic 3162

Telephone: (03) 528 5962

Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

General Manager and Secretary:

Bill Roper VK3ARZ

COUNCIL

President	Ron Henderson	VK1RH
VK1 Federal Councillor	Rob Apathy	VK1KRA
VK2 Federal Councillor	Roger Harrison	VK2ZTB
VK3 Federal Councillor	Peter Maclellan	VK3BWD
VK4 Federal Councillor	Rodger Bingham	VK4HD
VK5 Federal Councillor	Bill Wardrop	VK5AWM
VK6 Federal Councillor	Neil Penfold	VK6NE
VK7 Federal Councillor	Jim Forsyth	VK7FJ

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contest Manager:	Peter Nesbitt	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC:	Hans Ruckart	VK2AOU
FTAC:	John Martin	VK3ZJC
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZTB
QSL Manager(VK3,VK0):	Neil Penfold	VK6NE
Standards:	Roger Harrison	VK2ZTB
Videotapes:	Bob Godfrey	VK4BOB
WARC & CCIR:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

FEDERAL QSP

All organisations must be able to adjust to the rapidly changing world if they are to survive. The WIA is going through an important period of self-examination and re-organisation. Over the last twelve months the Board has spent a great deal of its time re-examining the Articles of Association and its method of operation. Some changes are mandatory to comply with new laws introduced by the Government, others simply reflect that we recognize the need to move with the times.

Changes always introduce some uncertainty and turbulence. We need every one involved to show some tolerance and patience. While the year has not been without its problems it has been marked by excellent co-operation by the member states. It is hoped that this environment of understanding will continue.

The Council will of course remain as the supreme policy formulating and controlling body but there is a real need to take a critical view at how we could become a better service organisation for our members at a time when their numbers continue to dwindle.

It is inevitable that the role played by the Board will change — as it has already changed — to comply with the changes introduced by law, and its relationship with the Council is where most of our attention is being focussed as the new draft Articles near completion. Our Annual Convention in May will no doubt spend a considerable amount of its time on these issues. Our Guest speaker will be a corporate lawyer to acquaint the Board members with their duties and responsibilities and to answer questions on the draft Articles before they are sent out to the Divisions for what will no doubt be a very close examination. To facilitate this process the Council has invited the President from each State Division to attend the Convention.

The Federal Office is also changing. The General Manager and Secretary, Bill Roper, has tendered his resignation after completing five years in the job. Since Bill started full time with the WIA his duties and working conditions have changed markedly. In recognition of this a sub-committee of the Board has been revising the duty statements.

Bill has put a lot of hard work into management of the WIA over those five years, not to mention all his EDP efforts. He raised our accumulated reserves from below \$1000 to over \$100,000. The Federal Council is very appreciative of his efforts and wishes him well in the future.

It is possible the successor position may be split into a part-time Company Secretary, servicing the Council, the Board and ASC matters, together with an Office Manager responsible for day-to-day business. Both positions would be advertised and selection made from written applications received.

We hope that Bill will be able to continue his association with the WIA in a new capacity that will reduce his workload but retain his skills, knowledge and experience.

Rob Apathy, VK1RA, Federal Vice President
ar

It is with deep regret I advise WIA members of the passing of the Federal President, Ron Henderson VK1RH on 26 April 1993 after a short illness.

Condolences have been extended to Ron's family on behalf of the WIA and all members.

Bill Roper VK3ARZ

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division Address	Officers	Weekly News Broadcasts	1993 Fees
VK1 ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7008	President Christopher Davis VK1DO Secretary Hugh Blemings VK1YYZ Treasurer Don Hume VK1DH	3.570 MHz 2m ch 6950 Rebroadcast Mondays 6pm 70 cm ch 8525 2000 hrs Sun	(F) \$70.00 (G) (S) \$58.00 (X) \$42.00
VK2 NSW Division 109 Wigram Street Parramatta NSW (PO Box 1068 Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Terry Ryeland VK2UX Secretary Bob Lloyd Jones VK2YEL Treasurer Bob Taylor VK2AOE (Office hours Mon-Fri 11.00-14.00 Wed 1900-2100)	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 52.120, 52.525, 144.120, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay via a local 2 metre repeater. Sunday 1000 and 1915. Highlights included in VK2AWX Newcastle Monday 1930 on 3.593 plus 10mx, 2mx, 70cm, 23cm. News headlines by phone (02) 552 6188. Some broadcast text can be found on the Packet network.	(F) \$66.75 (G) (S) \$53.40 (X) \$38.75
VK3 Victorian Division 40G Victory Boulevard Aashburton Vic 3147 Phone (03) 885 9261	President Jim Linton VK3PC Secretary Barry Wilton VK3XV Treasurer Rob Healey VK3XLV Office hours Tue & Thur 0830-1530	1.840MHzAM, 3.615 SSB, 7.085 SSB, 53.900 FM(R) Mt Dandenong, 146.700 FM(R) Mt Dandenong, 146.800 FM(R) Mildura, 148.900 FM(R) Swan Hill, 147.225 FM(R) Mt Baw Baw, 147.250 FM(R) Mt Macedon, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday.	(F) \$72.00 (G) (S) \$58.00 (X) \$44.00
VK4 Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (07) 284 9075	President John Aarsse VK4QA Secretary Ken Ayers VK4KD Treasurer David Travis VK4ATR	1.825, 3.065, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400 MHz, 52.525 regional 2m repeaters and 1296.100 9000 hrs Sunday. Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) \$70.00 (G) (S) \$58.00 (X) \$42.00
VK5 South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Bob Allan VK5BJA Secretary Msaurie Hooper VK5EA Treasurer Bill Wardrop VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.000 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555m 148.5000, 0900 hrs Sunday	(F) \$70.00 (G) (S) \$58.00 (X) \$42.00
VK6 West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 344 5241	President Cliff Bastin VK6LZ Secretary Phil Street VK6KS Treasurer Bruce Hedland-Thomas VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz. Country relays 3.582, 147.350(R) Bussellton 146.900(R) Mt William (Bunbury) 147.225(R), 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker broadcast repeated on 146.700 at 1900 hrs.	(F) \$80.75 (G) (S) \$48.60 (X) \$32.75
VK7 Tasmanian Division 148 Denwent Avenue Lindisfarne TAS 7015 Phone (002) 43 8435	President Tom Allen VK7AL Secretary Ted Beard VK7EB Treasurer Peter King VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNV), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) \$67.00 (G) (S) \$53.85 (X) \$39.00
VK8 (Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).		Membership Grades Full (F) Pension (G) Needy (N) Student (S) Non receipt of AR (X)	Three-year membership available to Australian resident (F) (G) (X) grades at fee x 3 times.

Note: All times are local. All frequencies MHz.

VK3MZ Super Sniffer

Ian Stirling, VK3MZ * describes his "Fox Hunting" Sniffer and discusses hidden transmitter locating.

This is one facet of amateur radio where home-brewing is still alive and well. Fox-hunting involves the participant in a variety of activities, these range from the construction of simple receivers and antennas to the excitement of the actual hunt.

To be a successful fox-hunter some constructional skills are required to build compact, rugged and reliable direction finding equipment. When tracking the fox transmitter some orienteering skills are required together with some good old fashioned cunning. All these things come together in fox-hunting to produce a friendly but competitive radio sporting activity.

The superhet receiver described in this article is suitable for most pedestrian style fox-hunting events. It combines small size with moderate sensitivity and selectivity. Adjacent band interference can be a problem with simple sniffers. This design however has sufficient selectivity to reject most out of band interfering signals.

The heart of this project is a Motorola MC3362 IC. Although

intended for cordless phones, the MC3362 contains some very good building blocks that can be used in other applications. The building blocks are as follows. Two active mixers intended for conversion to 10.7 MHz and then to 455 kHz and a third mixer for the quadrature detector. An outstanding VFO which is capable of operation up to 200 MHz. The internal VFO requires an external tank circuit but has internal varactor diodes which may be used for fine tuning or PLL applications. An internal Colpitts oscillator that only requires the addition of a crystal and two capacitors for operation; also a limiting IF amplifier and squelch circuitry. Only the first two mixers and the two oscillators of the MC3362 are used in this receiver.

A simple diode detector is employed which produces envelope detection of AM and resolution of FM by slope detection. This design also has an audio VCO which is very useful when hunting on signal strength. The human ear is able to detect very small changes in pitch but is fairly insensitive to changes in

amplitude. The audio VCO produces a "whoopie" sort of noise which has proven to be very successful in pinpointing the fox location, particularly where reflections are also being received.

Circuit Operation

The stage associated with the dual gate MOSFET Q1, is an RF amplifier tuned to the incoming fox frequency in the 144 MHz band. As well as providing approximately 20dB of gain and broad selectivity, this stage can be set to give considerable attenuation. Attenuation of the signal is required for close-in DF-ing. The voltage on gate-2 is set by the RF/IF gain control pot. The source of Q1 is biased positive by the 3V3 zener diode. When the voltage on gate-2 is reduced to zero by the gain control, the source is still at about +3.3V. This gives negative gate-2 to source bias, resulting in attenuation in excess of 20dB for the RF stage.

The signal is then coupled to the 1st mixer of IC1, the MC3362. Local oscillator injection into the 1st mixer comes from the internal VCO of IC1. Coarse frequency setting is achieved by adjusting the core of L3. Fine tuning is set by RV1 which changes the bias on varactor diodes within the MC3362 VCO.

The 10.7 MHz component of the 1st mixer output passes through a

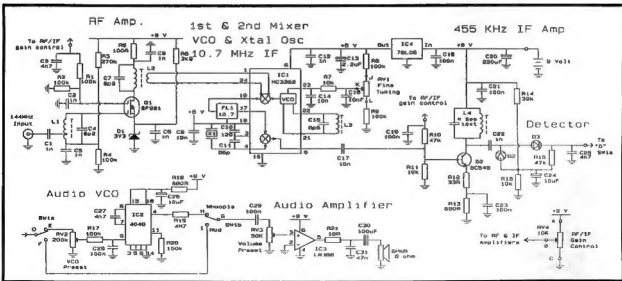


Figure 1 — VK3MZ Super Sniffer Circuit Diagram.

"garden variety" ceramic filter, without amplification to the 2nd mixer.

The 455 kHz output from the 2nd mixer is amplified by Q2 and detected by the simple diode detector D2 and D3. Q2 is controlled by the same gain control that affects Q1. The detector circuit is biased up by R14 and R15 to provide the DC offset that is required to get the VCO of IC2 (4046) into the audible range.

The detector output can be switched directly to the audio amplifier IC3 (LM386) for tone/modulation reception or it can be switched to the audio amplifier via the VCO of IC2 to achieve a "whoopie" output. The available audio power has been reduced by placing R21 in series with the loud speaker. This is to keep power consumption down and prevent possible damage to a miniature speaker.

IC4 is a voltage regulator and it is used to add frequency stability by providing regulated voltage to the oscillators of IC1. The VCO is not "rock locked" however the IF window is wide enough to allow for a few

kilohertz of VCO drift. The VCO may require fine tuning at the start of an event but does not require any further retuning for the duration of an event.

Any directional antenna may be used with this receiver such as a two or three element Yagi. An optional, but highly recommended addition to this receiver is a passive attenuator. A simple attenuator capable of about 40 dB attenuation helps in preventing receiver overload when DF-ing close in to the fox transmitter.

The project described in this article is for the 144 MHz band but with changes to the tuned circuits of L1, L2 and L3 this receiver could be tuned to any band below this frequency. The bypassing and supply decoupling capacitors of the Q1 stage would also have to be changed accordingly.

Construction Notes

This project is fairly straightforward but some RF construction experience would be required to build a unit that performs to the specifications.

Insert and solder the flat

components such as resistors and ICs first, followed by the capacitors and coils. The PCB has a copper ground plane on the top side. When inserting the ICs make sure the shoulders of the IC pins do not make contact with the ground plane. Many components have one lead soldered directly to the ground plane, this is indicated on the assembly diagram by a 'blob' on one end.

Insert a piece of tinned wire in the hole adjacent to pin 16 of the MC3362. Solder this wire to the ground plane and the underneath track. This joint connects the ground plane to the ground of the MC3362. Insert and solder a PCB pin in the pad near L1. The RF input is also soldered to this pin. The BF981 is inserted with the writing facing upwards and it should be inserted last. C1 is soldered between the PCB pin near L1 and one turn from the "cold" end of L1.

Alignment Procedure

Set RV1, RV2 and RV3 to the mid position. Apply power. A hissing noise should be heard from the speaker



all this for just:

\$279

Small wonder!

KANTRONICS KPC-3 low power 1200 baud economy packet controller.

The new KPC-3 is Kantronics answer to your requests for a simple 1200 baud packet controller suitable for portable and emergency operation as well as having all of the features you need for home operation.

- ★ New-user mode for simple operation and set-up.
- ★ Two comprehensive and easy to read manuals make installation and operation truly easy.
- ★ Has HOST MODE for full featured software support.
- ★ Complete with KISS mode, KA-NODE and Wefax, just like all the "big" TNCs!
- ★ Full featured mailbox with easily expandable memory for up to 512K mailbox memory with version 5.0 firmware.
- ★ Lithium battery back-up for static RAM.
- ★ Remote access with password protection for command changes.
- ★ Room for user-installed 9V battery for portable operation.
- ★ Operates on 6-20V DC @ <20mA
- ★ Measures only 130mm wide, 20 high and 130 deep, weighs <500g.
- ★ Supplied with PACTERM software for IBM-PC, optional HostMaster software for IBM-PC, Macintosh and Commodore-64 computers.
- ★ Optional cables available for easy installation.
- ★ 100% designed and manufactured in the U.S.A. for the highest quality and reliability.
- ★ Full 12 month warranty.

Please allow \$12 for postage and insurance within Australia mainland or overseas. Other areas please call for pricing. E&OE. All prices and information subject to change without notice. © Copyright 1990. Stewart Electronic Components Pty Ltd. All rights reserved.

Stewart Electronic Components Pty. Ltd.

A.C.N. 004 518 856

Bankcard, MasterCard and Visa welcome here.

Phone (03)543-3733

FAX (03)543-7238

44 Stafford Street Huntingdale : PO Box 281 Oakleigh 3166

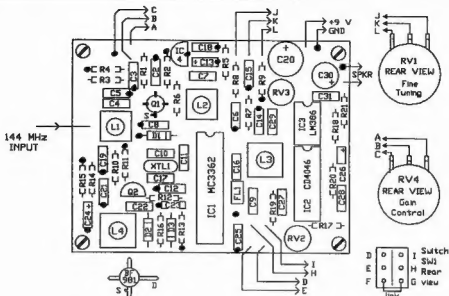


Figure 2 — Component Layout for the VK3MZ Super Sniffer.

when the "mod" position is selected and the RF/IF gain control (RV4) is set to the maximum position. If this is not the case check all joints and the wiring to the switch and pots, also check DC voltages.

Apply a strong, tone modulated signal into the RF input. Set the gain control to maximum and the fine tuning control (RV1) to the mid position. Adjust L3 until the modulation tone is heard. Adjust L1 and L2 for maximum received signal, the input level should be progressively reduced as the alignment proceeds. Check that RV1 allows fine tuning.

Reduce the RF input to zero and switch to the "whoopie" position. Adjust RV2 to produce an audio tone output of about 200 Hz. Increase the RF input amplitude and the audio tone will increase in pitch. This is the "whoopie" action of the audio VCO. The highest whoopie pitch can be altered by selecting R20 to suit. Increasing R20 reduces the highest pitch. Adjust the volume pre-set to a comfortable listening level and happy hunting.

Super Sniffer Specifications

Dual conversion with IF frequencies of 10.7 MHz and 455 kHz. Bandwidth — 20 kHz approx.

(depends on L4) Minimum Discernible Signal — less than 0.5 μ V.

Tuning range — Coarse, the full 2-metre band and beyond. Fine tuning, \pm 50 kHz.

Power requirements — single 9 volt, 20mA approx.

PCB Dimensions — 65mm x 80 mm (top-side ground plane)

Component Sourcing

Most of the components are standard and should be available from the regular component shops.

The frequency of the crystal is not critical. The difference between this crystal and 10.7 MHz sets the 2nd IF frequency. The prototype is laid out to accept a 455 kHz broadcast transformer. These can be tuned tens

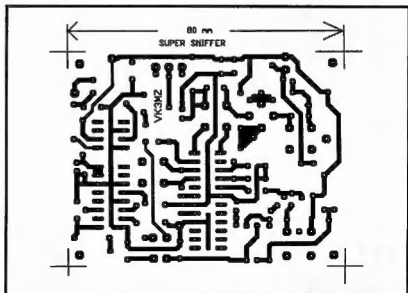


Figure 3 — VK3MZ Super Sniffer PCB Board (Actual Size).

of kHz either side of 455 kHz which allows for crystals other than 10.245 MHz precisely. In fact if you want to make your own IF transformer the choice of crystal and 2nd IF frequency is up to you.

FL1 is the 10.7 MHz ceramic filter. Most 3-pin 10.7 MHz ceramic filters will be suitable.

PCBs are available from the author at \$9.00 each plus self addressed envelope. I also have a limited number of coil formers, screening cans, ICs and crystals. If you have trouble sourcing these components write to me for further details.

Resistors

0.25 watt

R1 100k, R2 100k, R3 270k, R4 100k, R5 100R, R6 3k9, R7 10k, R8 100k, R9 100k, R10 47k, R11 10k, R12 33Ω, R13 680Ω, R14 39k, R15 10k, R16 47k, R17 100k, R18 680Ω, R19 4M7, R20 100k, R21 10Ω.

Capacitors

Ceramic or mono — block unless otherwise stated.

C1 1n, C2 1n, C3 4n7, C4 8p2, C5 1n, C6 1n, C7 8p2, C8 1n, C9 10n, C10 120p, C11 56p, C12 1n, C13 2.2u tant, C14 10n, C15 10n, C16 5p6, C17 10n, C18 100n, C19 100n, C20 220μF electro, C21 100n, C22 1n, C23 100n, C24 10μF electro, C25 4n7, C26 10μF electro, C27 10n, C28 100n, C29 100n, C30 100μF electro, C31 47n.

Semiconductors

IC1 MC3362, IC2 CD4046, IC3 LM386N-1, IC4 78L05
Q1 BF981, Q2 BC548
D1 3V3 zener, D2 OA95 etc.

Potentiometers

RV1 10k linear
RV2 100k trimpot — cermet miniature.
RV3 50k trimpot — as per RV2.
RV4 10k linear.

Coils

L1, L2 and L3 wound on Neosid 4-pin, 5mm former 52-061-64, F29 screw cores. L2 and L3 have screening cans.

Wind carefully to ensure that the shielding can does not touch the wire where it terminates on the former pins. L1, 4 3/4 turns on a 5mm former, 22 SWG diameter tinned copper wire, spacing between turns of one wire diameter, tap at 3/4 turn from C5 end. L2, 4 3/4 turns on a 5mm former, 24 SWG enamelled wire. 1.25 link turns wound around bottom of L2.

L3 same as L1 but no tapping.

T1, 455 kHz IF transformer from old pocket radio etc with integral capacitor.

Miscellaneous

Ceramic filter 10.7 MHz Murata SFE10.7MA etc.
Crystal 10.245 MHz, 10.24 MHz etc.
Miniature 8-ohm speaker.
Metal box.
Hook-up wire and mounting hardware.
Switches, 9V battery clip.

* 109 Glenvale Road, Ringwood North Vic 3134

BF

WIA News

Amateur Radio in Yellow Pages

Amateur radio clubs and associations can now be listed in the 1993 Yellow Pages directories, in all appropriate Metropolitan and Country issues around Australia.

The Yellow Pages National Headings Committee has agreed to a new index cross reference of "Clubs — Radio — See Clubs — Social & General".

Last year, following a Federal Board resolution at the October quarterly meeting, the Federal Secretary/General Manager was given the task of seeking from the Yellow Pages National Headings Committee that a national heading of "Clubs, amateur radio" be created, so that the WIA and amateur radio clubs and societies

who wanted to be listed could be readily contacted by people seeking information on amateur radio and amateur radio organisations.

The National Headings Committee replied on 3 March with the above advice on the new cross reference index, saying they believed "this is a more appropriate means of addressing the referencing needs of directory users and supporting the advertising needs of our clients on a national basis."

Not the result we all wanted, but an advance on the current situation. Write to your local Yellow Pages people with contact details of your Division, club or society now.

Beveridge Honoured

Harold H Beveridge, ex-W2BML,

died in January in New York state. He was 99 years old.

His name, if you hadn't already realised, is immortalised as the inventor of the Beveridge receiving antenna. He originally dubbed it the "wave antenna". Developed in 1917 to enhance communications between the US and Europe during WWI, it was first described in QST in November, 1922.

With more than 40 patents to his name, Beveridge considered his two greatest inventions were the wave antenna and diversity reception (which combats the effects of fading).

Beveridge received the American Institute of Engineers' Gold Medal in 1957 for his work in "national and world-wide radio communications."

A Postcard from Mount Gambier

Ivan Huser VK5QV * tells us what Mount Gambier is REALLY about.

For readers not wholly familiar with Mount Gambier, let me say that it is tucked away down in the lower south-east corner of South Australia, about halfway between Adelaide and Melbourne, close to the Victorian border, and about 27 kilometres from the southern coastline (Lat 37.50 S Long 140.46 E). Among the many attractions of Mount Gambier is the famous Blue Lake and the equally famous South East Radio Group (SERG) Convention held each year over the Queen's Birthday holiday weekend in June.

Volcanic Activity

The Crater Lakes of Mount Gambier are the result of volcanic activity. The outbursts (which would have been spectacular) took place along the edge of the main zone of activity centred in southern Victoria. Carbon dating of plant remains has shown that the main period of activity occurred around 4000 years ago well within the time of occupation by the original aboriginal inhabitants, and very recent in geological terms.

The eruptions were generally along lines of crustal fissuring starting with small flows of basaltic lava. Water from the shallow regional water table percolated down the volcanic conduits leading to the rapid accumulation of superheated steam. This caused the explosions that produced the craters and blowholes from which thick deposits of ash and scoria were ejected. The well known Devil's Punchbowl within the lakes complex is an example of such a steam vent.

The explosions caused large blocks of basalt and limestone (some weighing more than 20 tonnes) to be thrown out. Several examples of these volcanic "bombs" can be seen around the area lying in ash deposits. Although no eruption has occurred within recorded memory, it is impossible to predict whether the volcanoes will erupt in the future.



The communications tower at Potter's Point.

The Blue Lake

The best known of the Crater Lakes is the Blue Lake, which is 77 metres deep, five kilometres in circumference, and contains approximately 36,000 megalitres of water. Known as "Waawor" to the original inhabitants, the Blue Lake has been Mount Gambier's water supply since the late 1800s.

The water supplying the lake comes from the rainfall to the north via a confined limestone aquifer, and it has been estimated it could be

several thousand years before this water actually reaches the lake.

Carbon dioxide brought down with rain enables calcium (limestone) to be dissolved in the water as calcium carbonate. During the warmer months (mid-November to mid-March) crystals of calcium carbonate grow in the relatively warm water near the surface of the lake. The length of the crystals is resonant at the frequency of blue light, and so the lake takes on its distinct cobalt blue colour during this period.

The Blue Lake is best viewed near the middle of the day, between Christmas and New Year, when the sunlight strikes the surface of the lake at approximately right angles. Some of the light falling on the lake is reflected from the boundary between the warmer water near the surface and the colder water below. It is this boundary reflection of the light that produces the characteristic iridescence of colour.

The Dreamtime Legend

The Dreamtime legend of the local Boandik tribe of aborigines tells of the giant "Craitbul" and his family who wandered around the region looking for a place to live in peace. They camped and made ovens at Mount Muirhead to the north-west and at Mount Schanck to the south, but were frightened off both sites by the moaning voice of a bird spirit.

Moving to the Mount Gambier region, they managed to escape from the spirit and live there for a very long time. Again they made an oven, but one day water came up from below and put out their fire. They made others, each in turn being filled with water, until a total of four ovens had to be deserted.

Disturbed by their misfortunes, Craitbul and his family departed in search of a place where they might dig another oven, but no-one knows where they went. It is these deserted water-filled ovens that form the beautiful Crater Lakes of Mount Gambier.

Centenary Tower

Centenary Tower stands majestically on top of Mount Gambier, about 190 metres above sea level. It was built as an observation tower to



Mount Gambier's Centenary Tower, 190 metres above sea level.

commemorate the centenary of the sighting and naming of Mount Gambier on 3 December 1800 by Lieut James Grant RN, from HMS "Lady Nelson", while exploring the southern coastline of Australia.

The tower cost 482 pounds, 11 shillings and sixpence, and was funded by local subscription. The foundation stone was laid on 3 December 1900 by Sir Samuel James Way, the then Chief Justice of South Australia. However, due to lack of support, the tower was not completed until 1904, and was officially opened on 27 April of that year, before a gathering of 450 adults and 300 school-children.

From the tower, an area of approximately 8000 square kilometres can be scanned with spectacular views of the Crater Lakes and the City of Mount Gambier. The Grampians can be seen to the north-

east with Mount Schanck (another extinct volcano) and the Southern Ocean to the south. The horizon from this vantage point is 50 kilometres away.

When the flag is flying, the tower is open to visitors, and yours truly (Ivan VK5QV) is "in residence" as caretaker; so, come and make yourself known the next time you are in Mount Gambier.

For many years, the tower housed two-way radio communication equipment for public utilities and private companies, with antennas attached to each corner. At one time a HF wire antenna could be seen strung between the tower and a convenient radiata pine (what else) tree.

Although most of the radio equipment has been removed in recent years, two units still remain. This remaining equipment is installed on the roof of the tower, with a four-element Yagi (around 450 MHz) pointing towards Victoria, and a second antenna (around 77 MHz) cunningly disguised as a flagpole. Or is the flagpole disguised as an antenna?

During the fire season, the tower is used for fire spotting. When on duty, the fire spotter uses the roof where a sighting compass is placed and the top floor of the tower where the maps and communication equipment are housed. Communication is mainly by telephone, with a hand-held transceiver providing the necessary back-up.

South-East Radio Group

The genesis of the South East Radio Group can be traced back to

the late 1950s and early 1960s when, over a period of time, a small group of enthusiastic short-wave listeners visited the shack of Stuart VK5MS and listened to a number of talks given by Col VK5CJ.

It was, however, the transfer of Al Rechner VK5ZCR (now VK5EK) from Adelaide to Mount Gambier that triggered the callsign explosion in the early 1960s, leading directly to the formation of the South East VHF Radio Group in 1962. With the members all having "Z" calls, there was a common interest in that part of the radio spectrum 50 MHz and above; hence the initial VHF bias.

A "Who's Who" of foundation members includes:

John Lehmann	VK5ZHR now VK4AZK
Les James	VK5ZLS now VK1BUC
Dale Aslin	VK5ZER now VK5DA
Gary Smythe	VK5ZGR now VK5JR
Colin Schultz	VK5ZEV now P29?? (last known)
Colin Hutchesson	VK5ZKR now VK5DK
Trevor Niven	VK5ZTH now VK5NC
Jim Sinclair	VK5ZSJ now VK5ZSI (last known)
Chris Skeer	VK5ZFA now VK5SM
Trevor Hutchesson	VK5ZTH now VK5TH

For the first two years, meetings were held at the homes of members before the group moved to its first clubrooms, a two-roomed building at the rear of a deserted house situated close to the edge of a quarry at Glenburnie, some distance to the east of Mount Gambier.

This old, but comfortable, building was used as clubrooms for about 10 years, but as the quarry expanded the group was forced to move.

After several temporary meeting places, the group approached the corporation of the City of Mount

ATN ANTENNAS

& Accessories

Ask for a free catalogue

We manufacture a comprehensive range of HF, VHF and UHF antennas, baluns, power dividers etc. Log periodicals provide continuous coverage from 13-30MHz (incl. WARC) and replace outdated tri-banders.

Now in use in 31 overseas countries and six continents

- Rotators by Create, coax cables & non-conducting guy/halyard materials
- B&W all frequencies 1.8-30MHz end fed vees
- All frequencies 3.5-30MHz folded dipole 10W, 100W, 1kW No radials required
- Hard-drawn copper antenna wire and insulators.
- Aust/NZ distributor for Create antennas/rotators & Phyllystran (Kelvar) non-conducting guying materials

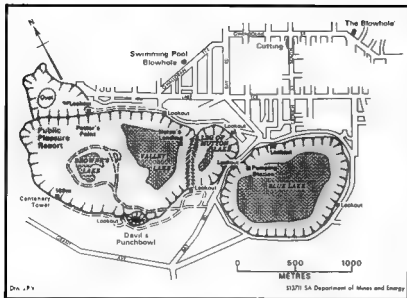
56 Campbell St, Birchlip Vic 3483

Phone: (054) 92 2224

Fax: (054) 92 2666.



- High gain VHF & UHF amateur, scanning & TV antennas
- Built section triangular aluminum towers for fixed or lift-over applications refer March/April 1987 ARJ.
- Selections of power chips and TX tubes at friendly prices.
- VSWR/PWR meters by Diamond to 1300MHz 5 models AI in stock



Map of Mount Gambier's crater lakes (with grateful acknowledgement to the South Australian Department of Mines and Energy).

Gambier for assistance in finding a permanent home. The result of this application is the present clubrooms in Olympic Park, just off O'Halloran Terrace on the southern side of the city.

Mount Gambier has an official population of around 23,000, and an amateur population of some 50 callsigns. Many amateurs in the area are "old timers" and can go back quite a way (some even remember valves). It is interesting to note that of the 38 VK5 members listed in the Radio Amateur Old Timers' Club Journal (current at the time of writing), 11 are from Mount Gambier and the surrounding district. This figure equates to approximately 30 per cent and must surely be some kind of record.

SERG Convention

The first convention was held over the June long weekend in 1963 and, since then, has become a very popular annual event. In 1993 the South East Radio Group held its 29th convention, and it was the fourth year that the National Fox Hunt Championship has been held as an integral part of the convention.

Over the years, the South East Radio Group has attempted to foster an interest in the noble and ancient

art of "home brewing" by conducting its very popular home-brew competition at the convention. With some positive and most welcome support from a person who wishes to remain anonymous, the competition has been enhanced in recent years with the introduction of various categories from the novice to the very experienced. There are categories to suit everyone and, rest assured, all entries will be well looked after.

The South East Radio Group Convention will once again be held over the Queen's Birthday long weekend (12 and 13 June 1993) and promises to be bigger and better than ever, with trade displays, disposal tables, competitions etc, and not forgetting the renowned SERG dinner superbly presented by the ladies of the group.

Further information regarding the convention and accommodation may be obtained by writing to the Convention Co-ordinator, South East Radio Group, Box 1103, Mount Gambier, SA 5290.

May I conclude by saying "Welcome to Mount Gambier and the 29th South East Radio Group Convention, and don't forget to bring along that piece of home-brewed equipment".

* 7 Bond Street, Mount Gambier, SA 5290

WIA News

IARU Launches Newsletter

The IARU has launched a newsletter, entitled *IARU News*. Compiled by Richard Baldwin W1RU, IARU President, the first issue was datelined February 1993.

The lead article in the two-page issue, on "The ITU Restructures", was authored by Michael Owen VK3KI (IARU Vice President) and David Sumner K1ZZ.

Of particular interest was an item on Sweden's introduction of an entry-level, code-free licence. Dubbed a "Class N" (Novice) licence, it is intended to encourage young students to become radio amateurs.

The new Class N licence can be held from the calendar year the licensee turns 10 years old, but until age 14 the young person is under the supervision of an older amateur holding one of the standard licences.

The Novices are permitted to operate on the 2 m and 70 cm bands, with power limited to 25 W PEP output and 100 W erp. The examination covers regulations, accepted safety standards and common amateur radio procedures. Novices are required to upgrade to a standard license within six years.

New Society for Canadian Amateurs

Canadian amateurs have had the choice of belonging to two amateur radio organisations for some years — the Canadian Radio Relay League and the Canadian Amateur Radio Federation. The two societies will merge this month to form the Radio Amateurs of Canada. The inaugural meeting is scheduled for 3 May.

The two societies will hold their final individual meetings on 1 May; their respective publications, *QST Canada* and *The Canadian Amateur*, will both publish in May and June. Their new joint magazine, *The Canadian Amateur*, will appear for the first time in July.

EQUIPMENT REVIEW

The ICOM IC-R72 All Mode HF Communications Receiver

Ron Fisher VK3OM * looks at ICOM's latest receiver technology.

ICOM have built up an enviable reputation with their line of HF communication receivers over the last ten years or so. The R-70 and R-71 receivers both performed to near professional standards but at non-professional prices. Many of these receivers have found their way into government and commercial organisations where they operate 24 hours a day with excellent reliability.

The IC-R72 has been around for a couple of years now and I thought it high time we had a close look at it. Compared to the R-70 and R-71 receivers, the operation of the R-72 has been greatly simplified. However in achieving this, many features of the earlier receivers have been eliminated. To balance this to some extent, some new features have been added.

It is both smaller in size and lighter in weight than its predecessors and is in fact compatible in size and appearance with the IC-725 and IC-726 amateur HF transceivers. Frequency coverage is guaranteed from 100 kHz to 30 MHz, and receive modes are upper and lower sideband, CW, AM and FM. The latter is available only as an option. An AC

power supply is built-in and operation from 12 volts DC is possible, but this requires an optional power cord and socket.

Dimensions are a compact 241 mm wide, 94 mm high and 229 mm deep and the all up weight is 4.8 kg. Having been brought up in the days when some form of a communications receiver was an essential part of the shack, I still consider a good receiver as a standard item in my set up. With most modern transceivers incorporating a general coverage receiver, I can appreciate many amateurs thinking that they can get along without a separate receiver. Well maybe, but one thing a modern transceiver cannot do is transmit and receive at the same time. You might need to check your transmitter for spurious outputs, check a contact on 80 while you are working on 20. The possibilities are only limited by your needs and imagination. If you have yet to qualify for your HF licence, then a good receiver is the way to check out activity on the DX bands, or maybe to listen to your local WIA broadcast. Interested? Well let's have a good look at the R-72 and see if it fits your requirements.

The IC-R72, Features and Facilities

Now let's look a bit closer at the R-72. It is double conversion for all modes except FM where it is triple conversion. The first IF is 70.45 MHz, the second is 9.01 MHz and the third (for FM only) is 455 kHz. The main SSB and AM filters are at 9.01 MHz and two narrow CW filters are available as options. Like any good piece of modern equipment, the R-72 is microprocessor controlled.

Frequency selection is via the smooth tuning control in ten Hz, one kHz, and one MHz steps. Direct frequency entry is available via the front panel key pad which lets you enter down to the last 10 Hz for spot-on accuracy. The actual tuning knob is extremely smooth to use and is heavily weighted to allow spinning across wide sections of the band.

When the AM mode is selected, the tuning rate changes to 1 kHz steps although this can be changed to 10 Hz steps if required. In the SSB and CW modes 10 Hz steps are the automatic selection. Frequency and status readout is via a large and clear LCD display. Frequency readout is to 10 Hz and mode and memory channel number are clearly displayed. To the left of the display is a fairly small "S" meter which is calibrated in standard "S" units up to S9 plus 60 dB and up to 5 for SINPO reports.

A common question asked about a piece of equipment these days is, how many memories does it have? Well the R-72 should satisfy everyone. It has 99 memories which store both frequency and mode. As we will see later, some of these memories can be used in rather ingenious ways. As an aid to sight impaired listeners, ICOM offer a speech frequency readout.

In line with its simplified operation, there are only three rotary controls, AF gain, squelch, and of course the tuning knob. There is no RF gain, bandpass tuning or notch filter. The AGC is switchable for fast or slow decay, but as there is no RF gain, it cannot be switched off. Ten and twenty dB front end attenuators are provided and can be cascaded to give 30 dB. The receiver RF stage can be switched in or out to improve strong signal handling. To complete



The attractive front panel of the ICOM IC-R72 receiver.

the interference rejection facilities, a two position noise blander selects normal or high blanking level.

Another operating aid is a built-in clock which can be set to turn both the receiver and an external tape recorder on and off. There is also another remote connector which will switch a tape recorder on and off when the squelch opens and closes. Very handy if you need to record a signal expected to come on air at some unknown time.

A unique feature is the AM tuning indicator. This lights up when an AM signal is correctly tuned. I found that it lights when the signal is within ± 500 Hz of the tune position.

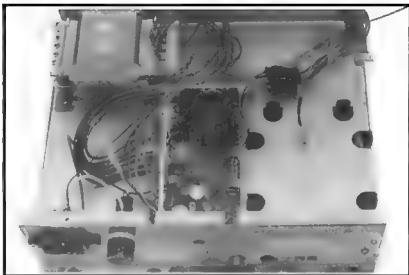
The rear panel provides a variety of interfacing connectors. AC power input is via an IEC three-pin socket which these days seems to be the standard. Both high and low impedance antenna inputs are provided, via an SO-239 coax for 50 ohms, and a pair of terminals for 500 ohms. One terminal is for the antenna and one for the earth connection.

The IC-R72 On The Air

I connected the receiver up to my multi-band dipole and Z match ATU. This enabled me to tune the system up on most frequencies covered.

Jumping from one frequency to another proved very easy. A push of the MHz button allows you to step up or down in one MHz steps using the main tuning control. Tuning up or down in one kHz steps is achieved in the same way. At long last, ICOM have put right the jumping frequency effect when changing sidebands in SSB mode. With the R-70 and R-71, change of sidebands produced a 3 kHz change in frequency readout. Tuning with AM selected changes the tuning rate up to 1 kHz steps which is one hundred times faster than SSB tuning. I would much prefer 100 Hz stepping as I feel the 1 kHz rate is too fast. It is possible to select the 10 Hz rate for AM, but this is then too slow. Please look at this one ICOM.

Audio quality via the external speaker is quite reasonable, but as the speaker is mounted in the top of the cabinet and therefore firing directly upwards, I am sure that in many situations an external speaker would have an advantage. I tried the



Under the top cover. This is the power supply. The open space on the right is for an internal battery for self contained operation.

receiver with the SP-3 external speaker with very good results.

Another thing noted early on was that the "S" meter was very reluctant to move off the stop on many very readable signals. Putting the "preamp" on helped, but did not overcome the problem. Later tests were to show why (see test section of this review).

The memory and scanning facilities on the receiver are most impressive. Let's look at the scanning first. There are four modes of scanning; programmed scan, memory scan, selected memory scan and the auto-write memory scan. The programmed scan searches between any two operator selected frequencies, these being entered in memories P1 and P2.

The scan will stop when a signal is received and in the case of an AM transmission it will stop right on frequency, because of the AM tune facility. Depending on the position of a rear panel switch, the scan will either stop until the signal goes off, or it will resume scanning after ten seconds.

The auto-memory scan is the ingenious one, though. Scanning the same range as set between P1 and P2 the receiver will put into memory the first 20 AM signals received. Great if you want to check out the activity on one of the shortwave broadcast bands.

One thing missed is any form of audio top-cut control. Band pass tuning would be ideal of course. Even a common tone control could be a big help in removing high frequency audio interference, particularly when trying to dig out weak AM signals.

In general, the receiver sounded very lively particularly with the preamp switched in. No trace of front-end overload was noted. ICOM do offer (as an option) a receiver protector unit. It actually opens the antenna circuit if you happen to fire up a kilowatt transmitter next door!

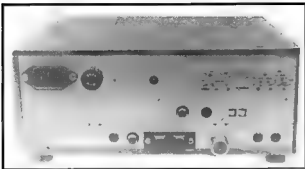
The best feature of all is the wonderful ICOM memory system. Select a memory and then tune away from it, up and down the band. Push the memory button again and you are returned straight back to the memory channel. Surely the most versatile memory system of all

The R-72 On Test

Confirming our on air tests, the receiver turned in a very good result in our lab tests.

The sensitivity was very level right across the whole HF range and averaged $0.25 \mu\text{V}$ for 10 dB SINAD for SSB and CW.

The "S" meter measurements showed up our concerns mentioned earlier. At S9 an input of $40 \mu\text{V}$ was required with the preamp switched in, and $80 \mu\text{V}$ with it out. So far so good.



Rear panel of the ICOM IC-R72.

At the low end of the scale though, 5 μ V was needed to give an S2 reading with the preamp in, and 10 μ V with the preamp out. With conditions the way they are on the higher frequency bands, you won't see the "S" meter moving a lot!

Audio response in the USB mode measured at 14.2 MHz was -6 dB at 170 Hz and 2.5 kHz. The curve between these points was very smooth.

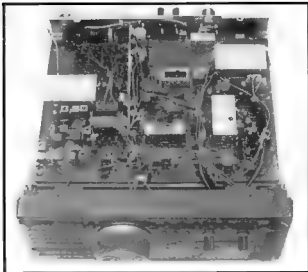
Response in the AM mode at the 6 dB points was measured at 100 Hz and 2.7 kHz. It seems that the audio end of the receiver was a slightly restricted response for a communications receiver is fair enough. Receiver audio output was measured at the external speaker jack. Terminated with a 4 ohm load, 4.8 watts at 10% distortion was produced. With an 8 ohm termination this dropped to 2.2 watts which is just a fraction above ICOM specification. SSB audio distortion at 500 mW output was a creditable 0.75%.

A final test noted that there was a significant difference in the response of lower sideband compared to upper sideband. As no circuit is supplied, it was not possible to determine the system used to produce the carrier frequency. However it may well be similar to the circuit used in the IC-725 transceiver, which suffers a similar quandary. Calibration accuracy was excellent, within ± 20 Hz. If you require something better than this, a high stability temperature controlled master oscillator can be installed as an extra cost option.

The IC-R72 Conclusions

The R-72 is a very competent full coverage receiver.

The main circuit board of the ICOM IC-R72 receiver. The SSB filter is in the centre of the photograph.



It offers very simplified operation and therefore can be recommended to most short wave listeners. If you like to pull through the hard-to-find signal on the short wave broadcast bands, you might find the performance lacking in several areas. Without bandpass tuning, a notch filter or even a tone control you don't have a lot of control over what you are receiving. In other words, it doesn't take the place of the R-71 which does incorporate most of the above. To be fair though, I am sure the R-72 wasn't designed to replace the R-71. The AM

received quality is much better than the R-71 and the frequency readout definitely superior.

The instruction manual is aimed at the general operator and covers these aspects well. Service manuals are available for the technically minded.

Our thanks to ICOM Australia for the loan of our review receiver and all enquiries should be directed to them. Current retail price of the IC-R72 is \$1664-60.

* "Gaerlaningeh", 24 Sugarbaf Road, Beaconsfield Upper Vic 3808

IT

WIA News

Call for Papers

The ARRL Conference on Digital Communications (formerly the Computer Networking Conference) has issued a call for papers.

Technical papers for the Conference may be on any aspect of digital communications in Amateur Radio.

Deadline for receipt of camera-ready papers is 30 July, 1993. The Conference has been tentatively scheduled for 11 September at the University of South Florida in Tampa, FL USA. It will be hosted by the Tampa Local Area Network.

Further information can be obtained from Maty Weinberg at ARRL HQ, 225 Main St,

Newington, Connecticut 06111 USA. (Thanks to the ARRL Newsletter).

Growth in Japanese Amateurs

The number of amateur radio operators in Japan had reached almost one and a quarter million by September last year. With 1,242,550 stations licensed, amateurs represented 15.5 per cent of all radio and communications stations licensed in Japan at the time.

In the three months between June and September, the number of amateur licensees grew by 20,336 — that's more than the total amateur population of Australia!

AR Single Coil Z Match — Part 2

In the final part of this interesting article, Lloyd Butler VK5BR* describes his in-depth experiments, and the overall performance of the AR "Z" match, plus modifications to use the AR Z Match on 1.8 MHz.

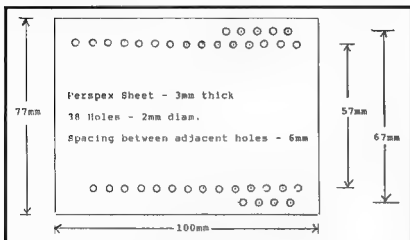


Figure 3 Perspex support sheet for coil

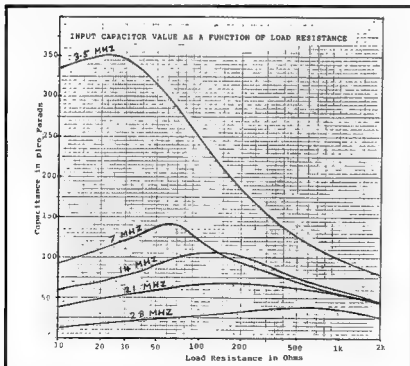


Figure 4 Input capacitor matching

Performance

Tests on the single coil Z match units have been carried out at 3.5, 7, 14, 21 and 28 MHz. Initial load impedance tests were carried out by loading the output with incremental values of resistance between the range of 10 and 2000 ohms and adjusting the Z match tuner for correct match. To set up for a match, a noise bridge with its output connected to a receiver was loaded with 50 ohms resistance. With the receiver set to the required frequency, the noise bridge was adjusted for a balance indicated by the noise null. The 50 ohm resistance was then removed and replaced with the input of the Z match tuner.

With the controls of the noise bridge unchanged, tests on each selected load resistance were carried out by adjusting the two variable capacitors for a match as indicated by the noise null. The variable capacitor dial readings were logged against each load resistance tested. Calibration of capacitance measured against dial readings later allowed conversion of dial readings to direct capacitance. Using the above procedure to obtain the readings, calibration curves for the unit of figure 2 have been compiled.

Figure 4 plots the series capacitance required for each frequency measured over the resistance load range of 10 to 2000 ohms. Figure 5 plots the capacitance required in each half of the split stator capacitor for each frequency over the same load range. From these we see that the input capacitor tuning range is around 20 to 350 pF and the split stator capacitor tuning range is around 20 to 250 pF per side.

A very interesting observation in figure 5 is that we require much more capacity across the coil for 14 MHz than for 7 MHz, the lower of the two frequencies. This clearly shows that at 14 MHz we make use of the upper frequency resonant range with less inductance whereas at 7 MHz we make use of the lower frequency resonant range with the full inductance.

The idea of the Z match tuner is to interface with a wide range of complex impedances as exhibited by all sorts of odd lengths of antenna

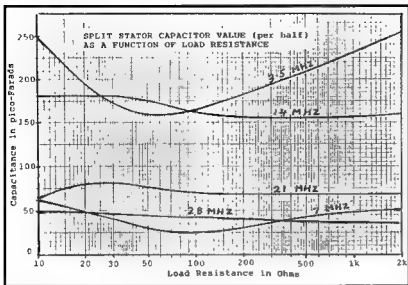


Figure 5 Shunt capacitor matching

wire. This means it must match loads which include a considerable reactive component. Possible combinations of reactance and resistance are numerous but some sort of check is needed to assess the performance of the tuner with reactive loads. For my tests I used a fixed 50 ohm resistance in series with various reactances in the range of minus 1000 ohms to plus 1000 ohms.

At frequencies of 3.5, 7, 14 and 21 MHz, I was able to match the load for the complete test range. At 28 MHz, I was able to match for around minus 250 ohms to plus 800 ohms. The capacitance settings over the test range for the input capacitor and the split stator capacitor have been plotted in figures 6 and 7 respectively. These particular curves have been joined up from a limited number of

plot points and hence are not guaranteed to be too precise. I did not include 28 MHz as I had some doubt about the validity of the readings considering the small capacitance values I had to use in the load for this band.

In introducing reactance into the load, the matching system must correct for this and obviously something must be retuned as shown in figures 6 and 7.

What is interesting in figure 6 is the dramatic fall in the value of series input capacity when reactance is introduced. This is particularly noticeable at the low frequencies. As part of the "L" matching network, the input capacitance must decrease when load resistance is increased. Hence, adding reactance to the load also increases the resistive component reflected across the network and possibly makes it easier for a match when the load resistance is low.

Measurement of percentage power loss in the single coil Z match tuner, for a complete range of load conditions, would have been a mammoth task. Hence, power loss measurement was limited to a load of 50 ohms resistance. To carry out this measurement, the transmitter was

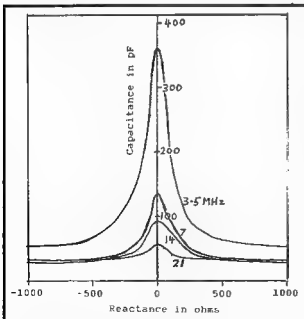


Figure 6 Input capacitor matching for different values of reactance in series with a 50 ohm resistive load.

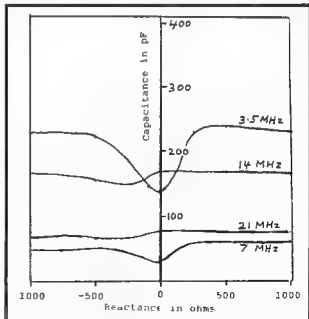


Figure 7 Shunt capacitor matching for different values of reactance in series with a 50 ohm resistive load.

firstly fed directly into a Marconi RF power meter which incorporated a 50 ohm dummy load. The power measurement was recorded and the meter was then fed via an SWR meter and the tuner. The latter was adjusted for lowest SWR and the transmitter was checked to see that its loaded condition was the same as before. A second power measurement was recorded and percent power loss was derived from the two results.

I was unable to detect any appreciable power loss at 3.5, 7, or 14 MHz. At 21 MHz, loss appeared to be in the region of 10% to 15% and at 28 MHz in the region of 20% to 25%. In all fairness to the single coil Z match, similar losses at the highest frequencies were also found in the two coil Z match (refer my report Amateur Radio, December 1990).

1.8 MHz

The Z match unit under discussion was never meant for operation at 1.8 MHz. However, it can be made to work on that band by adding capacity to the two tuning components. Figure 8 shows the total input and total shunt capacitances required to make it work for various values of load resistance. As far as shunt capacitance is concerned, this is only added to the value across the full coil and nothing is added at the coil centre. The curves are plotted for the complete load range of 10 to 2000 ohms although for most of us, with electrically short antennas on this band, resistance above 50 ohms is probably irrelevant.

The addition of three fixed capacitors and a 4 position switch as shown in figure 9 gives the whole load resistance range at 1.8 MHz. If satisfied with just the lower resistance range, two fixed capacitors and a two position switch would do the job. To check operation, I used ordinary 350 volt mica capacitors. With these fitted, I fed over 200 watts from my aging FDX401 through the tuner into a dummy load and later into my 1.8 MHz antenna. Nothing arced or blew apart but I strongly suggest higher voltage capacitors if they can be obtained.

I wondered whether the high C to L ratio used on this band might result in lower efficiency in the tuner but a

power efficiency check, with the 50 ohm load, did not reveal any appreciable losses.

A PVC Tube Model

At the time of almost completing this report, I received from my Melbourne colleagues, the latest version of the Z match coil assembly formed with PVC tubes. As I mentioned earlier, they have been experimenting with an assembly which is hopefully easier to construct. The primary inner coil is wound on one piece of PVC tube with a second larger piece, containing the secondary coil, slipped over the inner winding. The construction is such that the coil dimensions and coil spacing

are close to those of our perspex plate coil assembly which has been evaluated in this report. Precise details will not be dealt with at this stage as it is intended that an article on the finalised form will be forthcoming in an issue of Random Radiators.

As received, the primary coil had the required 14 turns with provision to tap at the selected points of 7 and 10 turns but the secondary was fitted with 7 close wound turns instead of the 4 as in the perspex plate version. With this arrangement, I found gaps in the load impedance range so I rewound the coil with 4 turns spaced to around 24mm as in the other version. As far as the windings

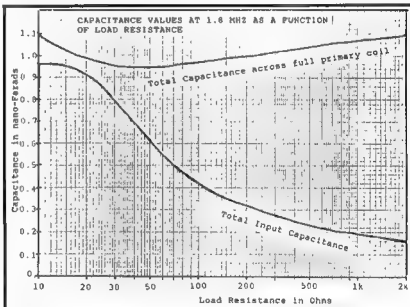


Figure 8 Matching capacitances for 1.8 MHz.

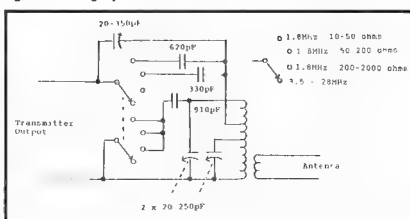


Figure 9 Z Match Circuit with additions for 1.8 MHz.

themselves were concerned, the two coil assemblies were now near identical and I was able to make a direct comparison of load resistance range

The curves for the PVC tube model followed the same general format as the other, with some deviations, but satisfying the required range. One noticeable effect was the reduced value of capacitance needed for a match in the shunt circuit of the PVC tube model. The curves of figure 5 were in effect shifted some 10 to 15 pF downward. My only concern about this was the load resistance point around 100 ohms for 7 MHz.

Referring to figure 5, we see that at this point the capacitance required is 25 pF. With the curve shifted down, we could well be limited by the minimum capacitance of the variable tuning gang. The question is what caused this tuning shift? I could not see how the inductance could have changed by any appreciable amount so I have had to assume that the dielectric constant of the PVC (much higher than air) has increased the distributed capacity in the coil. In our perspex plate assembled model, the core is mainly air.

Even if an exact match cannot be achieved at this one point, it is only one point and in practice it would probably go unnoticed. If the minimum value of capacitance in the tuning capacitor is really a concern, a correction can be made by slightly reducing the circuit inductance. This is done by placing a short circuit across turns 13 and 14 of the primary coil. I anticipate that in practical application such a modification will be unnecessary.

At low frequencies, there appeared to be little difference in power efficiency between the PVC tube model and perspex plate model. I experienced some difficulty in interpreting my power measurements on the two highest frequency bands but at 28 MHz the measurements did indicate a lower efficiency in the PVC tube module. PVC is not renowned for its high frequency characteristics and perhaps the measurements indicated losses in that material.

Capacitor plate spacing

In selecting the tuning capacitors some consideration should be given to spacing between the plates. This requirement can be worked out now

that we have produced the curves of figure 4. We can easily calculate that when matched to present 50 ohms at the tuner input, the peak voltage is 100 for 100 watts of power and 200 for 400 watts of power. The voltage across the tuning system is equal to that voltage multiplied by the value of loaded Q and the loaded Q is derived by dividing the reactance of the input capacitor by 50 ohms. We now look at figure 4 and select a point where the capacitance and frequency calculates to give the highest value of reactance in the input capacitor. This produces a reactance of around 580 ohms at the highest load impedance for 3.5 MHz and a calculated loaded Q equal to 11.6. Multiplying the peak input voltage by this value, we get a maximum voltage of 1160 for 100 watts of power and 2320 for 400 watts of power.

The above calculation is based on the input capacitor being connected to the top of the coil as in figure 1. In our circuit of figure 2, the connection is tapped down and I think we have to allow for a 40% increase in the calculated voltage across the split stator capacitor. On the other hand allowing for the fact that the

SOME THINGS HAVE NO COMPARISON

amateur
radio
action

The magazine for the serious radio operator
AT YOUR NEWSAGENT EVERY MONTH

calculation was made on a worst case sample of Q, we might work on a little over 1000 volts for 100 watts operation and a little over 2000 volts for 400 watts operation. For this we need capacitor plate spacing of not less than 0.25mm at 100 watts and 0.5mm at 400 watts. Old receiver tuning gang capacitors are commonly found with around 0.25mm of spacing and hence are good for 100 watts in the Z match tuner. Capacitors with spacing of 0.5mm or greater, suitable for 400 watts, are harder to locate but are often found at our radio trading marts. However, to obtain our required 250 and 350 pF in this wide spacing can be a problem.

Conclusion

The idea of using a single coil assembly with two resonant states, to form the shunt element of a "L" match circuit, has been well proven. In the form of our familiar Z match it can be made to match a wide range of load impedances over a wide range of frequencies. Tests on our particular sample have produced results equal to those previously obtained from a two coil Z match but with the bonus that it is simpler to construct and with

no switching, has only two controls to adjust.

Coil arrangements for the Z match, other than our discussed sample and which have different inductance and different coupling arrangements, can be made to work. However, unless the particular design is checked over a load range as I have done, overall performance is an unknown factor. I suggest, that unless one is prepared to go through the test procedure and trim the coil as required, the safe thing to do is to stick with the coil design as described.

Our tests have been carried out on a single coil Z match unit with what is virtually an air wound coil assembly held together with a perspex plate. This assembly is the same as that which has traditionally been used in two coil Z match units. Properly constructed, it looks nice and is efficient. You might choose to build this assembly or try out a different idea such as the PVC tube method we have briefly discussed.

The ideas team in Melbourne are working on all of this and we can expect to see more of the construction detail in the Random Radiators column.

References

1. T.L. Seed ZL3QQ. A Single Coil Z match Antenna Coupler, Break In, March 1982
2. Random Radiators (VK3OM & VK3AFW). A New & Better Z Match Amateur Radio, August 1992.
3. Random Radiators (VK3OM & VK3AFW) The "AR" Single Coil Z Match, Amateur Radio, February 1993
4. Lloyd Butler VK5BR. Analysis of the Z Match Antenna Tuner, Amateur Radio, May 1989
5. Lloyd Butler VK5BR. Tests on the Compact Coil Version of the Z Match Tuner, Amateur Radio, December 1990.

© 18 Ottawa Avenue Penrith SA 5041

RF

**Remember to leave
a three second
break between
overs when using
a repeater.**

WIA News

More Good Publicity for Amateur Radio

Well-known Sydney amateur, Ian O'Toole VK2ZIO, scored some very positive publicity in February in the *Hills Shire Times*, a local area newspaper covering the North and Western districts of Sydney.

The story, written by reporter, Peter Gladwell, covered Ian's interest in restoring old military radio communications equipment. The lengthy story included a photograph of Ian and his son Andrew, with a Type A Mark III portable transceiver of WWII vintage.

Probably the best quote from the story was this: "The biggest difference between amateur radio and CB radio is the fact that we have a large possible variety of things you can do, where on CB

you can only talk to someone else."

The piece also gave details of amateur radio classes conducted by Ian, along with his phone number.

Then, in the March issue of *PC User*, Matt Howard contributed a lengthy piece on digital communications in amateur radio, concentrating on packet radio.

Matt gave some background history and details on the AX25 protocol. He discussed the setup at his own station, including costs of transceivers and packet components.

At the end of his article, Matt referred interested people to the WIA for details on contacting a local club, and praised the NSW Division's correspondence course which he used to study for his licence.

A Call to all Holders of a Novice Licence

Now you have joined the ranks of amateur radio, why not extend your activities?

The Wireless Institute of Australia (NSW Division) conducts a Bridging Correspondence Course for the AOCP and LAOCP Examinations

Throughout the Course, your papers are checked and commented upon to lead you to a successful conclusion.

For further details write to:

The Course Supervisor
WIA
PO Box 1066
Parramatta NSW 2124
(109 Wigram Street, Parramatta)
Phone: (02) 689 2417
Fax: (02) 633 1525

**11am to 2pm Monday to Friday
7 to 9pm Wednesday**

HFC* Regulated Variable Voltage Power Supply

Another great construction project from *Drew Diamond VK3XU* **

For experimental radio and electronics work, particularly with MOSFET and other solid-state power amplifiers, there is a need for a regulated dc power supply, variable from less than 5 V to about 25 V at up to 2 A. A search of local journals did not reveal a simple design which would reasonably suit. Supplies of 12 V or 13.8 V seem to be pretty well catered for, and the 3 to 18 V area also. The following supply is offered as a reasonably cheap and effective solution to this perceived gap.

Circuit

The well-known and proven LM723 performs the regulating function. The internally generated 7.2 V reference at pin 6 is halved to 3.6 V and applied to the error amp non-inverting input at pin 5, thus establishing the minimum output at about 4 V. Error signal from the output voltage divider is applied to the inverting input at pin 4. The 723 can only supply up to 100 mA on its own, so the output current at pin 10 drives a 2N3055 (or similar)

power transistor as series pass regulator element.

The voltage applied between pins 2 and 3 controls the current availability. So, as the voltage approaches 0.6 V dropped across the series sampling resistor, the supply will go into constant current mode. Greater or lesser current capacity can be obtained by changing the value of series sampling resistor; 0.25 ohm will give about 2 A, 0.5 ohm will give 1 A, 1 ohm 0.5 A and so on. If a sufficiently rated transformer and '3055 heatsink is used, the series resistor may be reduced further to obtain a higher current output accordingly. The circuit shows examples of values of series resistor and resultant current limits available.

The transformer secondary voltage is about 28 V, current rated according to requirements. 10 A bridge rectifier and filter capacitor supply the "raw" dc supply of about 34 V under full load. When the supply is switched off, the filter capacitor is discharged through the 1 k 5 W bleed resistor.

Any tendency to self-oscillation is suppressed by inclusion of the 560 pF ceramic capacitor between the HF compensation pin, and the invert input pin. Stability is further improved by the addition of the 47 μ F electrolytic right at the output terminals. RF energy is effectively discouraged from entering the supply with the inclusion of the 0.1 μ F ceramic.

With a bench supply, there is always the possibility of reverse voltage being accidentally applied (eg in battery charging), and inductive loads may "kick back" a voltage spike when disconnected, so it is prudent to include a hefty diode, reverse connected, right at the output terminals, and a series diode to prevent external voltages reaching the regulator should mains voltage be removed.

Options

What follows accounts for the "horses for courses" of the title. The minimum output voltage is fixed at 4 V, which can easily be changed to any value up to about 8 V by juggling the ratio of the two series resistors at pins 5 and 6, or 8 V can be made the

Performance

Voltage Range: 4 to about 28 Vdc (see Options).

Current Capacity: 2 A (see Options).

Load Regulation: Within ± 10 mV from no-load to full-load.

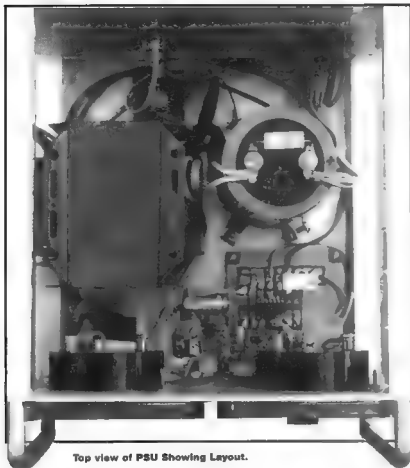
Line Regulation: Within ± 10 mV for $\pm 10\%$ change in mains voltage.

Ripple and Noise: Less than 8 mV p-p.

Output Protection: Short circuit and reverse polarity.



HFC Power Supply.



minimum simply by connecting pins 5 and 6 direct.

If voltages as high as 28 V are not required, say for example you only need to work up to 18 V, then an 18 V transformer should suit. The maximum voltage which may be applied to the '723 is 40 V, so for outputs higher than about 30 V, the '723 must be supplied from a lower voltage.

If it is required to vary the current limit, the series resistor may be wired as a "string" with a switch to select the appropriate resistance, stepping from (say) 0.1 ohm for 5 A, to 2 ohms for 250 mA.

No over-voltage protection is provided. In the unfortunate event that the '3055 goes short between collector and emitter, the full output voltage may be applied to the load. If over-voltage protection is required, the reader is pointed to References (2) and (3), where suitable adaptable circuits will be found.

A fuse, rated at the maximum current required, may be wired in series with the raw dc output, between the positive terminal of the filter capacitor, and the collector of the '3055. If the '3055 does fail under extreme conditions, the fuse will blow and prevent any further current flowing into the load.

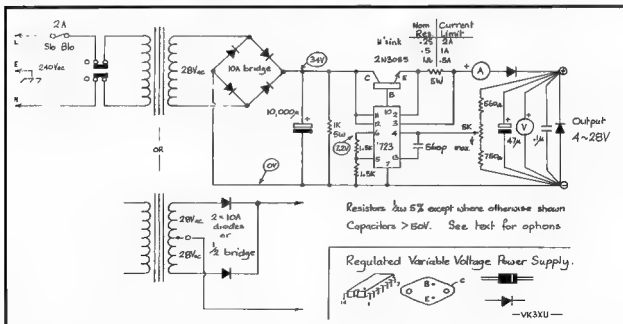


Figure 1 — Regulated Variable Voltage Power Supply (VK3XU).

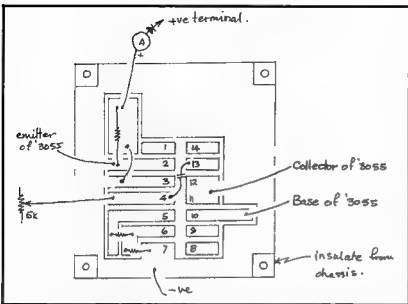


Figure 2 — LM723 Component Locations.

For an "on" indicator, wire a LED in series with a 1 W resistor of about 2.2 k across the filter capacitor.

Switching transients from the bridge may reach sensitive equipment and cause line buzz. If this is a possible problem, connect a 0.01 $\mu\text{F}/100\text{V}+$ ceramic across each diode of the bridge, and from each output terminal to chassis ground.

Construction

The most costly component would probably be the transformer, if needed to be purchased new. However, this aspect has been addressed, and the reader is pointed to Reference (1) where will be found a valuable article on how to re-wind an old TV transformer for a similar supply. The transformer is not critical, a secondary in the order of 28 Vac at about 2 A (or whatever current is required) would be fine. The usual electronics suppliers have some 56 Vac centre tapped transformers, so a simple two-diode arrangement will be required with these (as shown on the circuit). Note that if a 56 Vct transformer is rated 2 A, then it should be possible to supply 4A dc in this instance, because each side of the winding only supplies current for one half cycle. Also available, for about half the cost, is a 30V/2A unit, which should suit a 1 or 2A dc supply.

My own application needed a fairly rugged assembly, so 3 mm thick aluminum sheet was used for front and back panels, connected with 15 mm square section rod as shown. Any substantial ready made, or home-made box would serve, depending on individual resources and needs. The rear panel also functions as heat sink for the '3055, which is mounted with the appropriate TO3 hardware. Both sides of the insulating washer must be smeared with heatsink compound.

An insulated cover should be placed on the '3055.

The circuit shows schematically that the output voltage divider should be wired directly across the output terminals in accord with standard practice, thus considerably improving the voltage regulation characteristics.

A small circuit board accommodates the '723 and associated components. A 14-pin wire wrap socket greatly offsets any "fiddliness" of the layout for this component. Any other wiring method, such as matrix board, Vero, ugly etc may be employed as desired.

All mains terminations must be adequately covered to prevent accidental contact, and mains earth must be connected to chassis ground with a dedicated lug. Due to the low impedance of the transformer primary, a normal fuse may blow on switch-on, so a "slow-blow" fuse will be necessary.

Testing

Check all wiring, and that polarised components are correctly located. Remove the 723 from its socket, then switch on. No output voltage should be indicated on the voltmeter. With your multimeter, measure the voltage across the filter capacitor; it should read about 1.3 times the transformer secondary voltage (eg 36 V). Switch off, and allow the capacitor to discharge.

discharge. Insert the '723, then switch on. You should be able to vary the output from about 4 V to 28 V. Connect a load of suitable resistance and power rating (a combination will probably be required). At full load current, the output voltage should not change by more than 10 mV. Check at various voltages and appropriate load values.

Poor or erratic regulation may indicate oscillation. The value of C between pins 4 and 13 may be increased (try 1000 pF) until satisfactory regulation is obtained. Capacitors should not be connected to any other IC pins, as these will probably degrade stability. Check also that the unregulated input voltage is always at least 6 V higher than the expected output voltage; ie there is sufficient voltage reserve available.

After a period of operation at low output voltage/highest current, the "3055 will become moderately hot, but certainly it should not routinely be allowed to get "stinking hot". Fit additional heatsinking if this is a problem.

If your supply will not work satisfactorily for some reason which cannot be figured out, or further information is required, please write to the author at the address above. An SASE for reply would be appreciated.

References and Further Reading

1. Home-Brew Regulated Power Supply- Greenham, VK3CQ, AR July '85.
2. 28V High Current Power Supply- Any recent ARRL H'book
3. Shunt-Protected Power Supply- Hartkopf, VK3AOH, VHF Comms Winter '89
4. 18V/1A Benchtop Supply- Evans, EA Aug '91.
5. The Art of Electronics- Horowitz & Hill, Cambridge University Press.
6. 138 V Power Units- Hatch, G3ISD, Rad Com July '83.

Parts List

Resistors

0.25 or 0.22 ohm 5 W (for 2 A).
560 ohm 1/2 W 5%
750 ohm 1/2 W 5% (or two 1.5 k).
1 k 5 W
1.5 k 1/2W 5% (2)
5 k lin. pot, or preferably, 2 x 10 k dual pot with gangs wired in parallel.

Capacitors:

560 pF ceramic, 50 V.
0.1 µF ceramic, 50 V
47 µF electrolytic, 50 V.
10,000 µF (minimum), 50 V.

Semiconductors:

10 A, 100 V bridge (or 4 diodes).
Motorola or "brand name" 2N3055.
LM723 IC
5 A+ diodes (2) required for output protection.

Miscellaneous

Case to suit or material for same, transformer, heatsink (if additional req'd), DPDT mains switch, fuse and holder, appropriate Volt and Amp meters, 14-pin DIL socket, circuit board material, red and black output terminals, hook-up wire, mains power lead.

* *Horses For Courses*
** *"Narr Mean", Gatters Road, Wange Park VIC 3115*

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the Federal Membership Register during the month of January 1993 (we regret that this list was omitted from the March 1993 issue).

L20906 MR R T HEATON
L20908 MR A KAVANAGH
L20910 MR J A RYAN
L20911 MR S NORMAN
L20912 MR D THOMAS
L20913 MR P TITZE
L20914 MR F A GUBBINS
L30832 MR E ANDOR
L30834 MR D ROGERS
L30835 MR R I MORGAN
L40340 MR J E BURGESS
VK1ZTM MR R L WAITE
VK2DHM MR F MIKE
VK2GOL MR H K GOLDFHOFER
VK2GUX MR C LUCKMAN
VK2GVQ MR P BULANYI
VK2XNZ MR B S FURBY
VK3MIR MR C A BISHOP
VK3MIZ MR I BLEZARD
VK3MJF MR K JENKINS
VK4BL MR R K BROWN
VK6JB MR A F WAHL

The WIA bids a warm welcome to the following new members who were entered into the Federal Membership Register during the month of March 1993.

L10149 MR R COLLMAN
L20923 MR F W GROSS
L20924 MR P JOHNSTON
L20925 MR D J MARTIN
L20926 MR D BARRY
L20927 MR B J LATTI
L20928 MR G A MCGILVRAY
L20931 MR D J NURSE
L30837 MR L M DUGDALE
L30838 MR A KRINOV
L30839 MR P RICHTER
L30841 MR E O KRISTA

L40342 MR R P CHATTERTON
L50610 MR J C SUTHERLAND
L50611 MRS J HARRIS
L60320 MR A D MASSHEDER
L60321 MR R N MAY
L60322 MR P A PHILIPS
L70111 MR R B FINLAYSON
VK2AD MR S BRUCESMITH
VK2AMJ MS M E JACKSON
VK2ASZ MR A S ALFORD
VK2AZQ MR A HAVYATT
VK2CRB MR R BENFATTO
VK2DAA MR G A HILL
VK2DSL MR S W LINTON
VK2KIS MR G C PROUT
VK2MEC MR A S MUELLER
VK2MMR MR D M COOKE
VK2TAC MR G FAULKNER
VK2TBO MR H E DYER
VK2TFP MR P A THOMPSON
VK2TSR MR G R BARKER
VK2XXX MR A RUNIEWICZ
VK2YRX MR R W WALKER
VK3AYZ MR R CASSIDY
VK3DDU MR P HOLMES
VK3EXJ MR R W ROBERTSON
VK3KAB MR D WILLIAMS
VK3LRE MR R J ELDRIDGE
VK3MJH MR C CLARKE
VK3NIM MR J NOCKER
VK3TAZ MR J LIDDELL
VK3TPO MR E K PETER
VK3VCF MR C FINNIE
VK3YGA MR G APRILE
VK4KGT MR R C Fysh
VK4PWN MR M MERRYLEES
VK5BZ MR C B ZERBE
VK5MAB MR A W BUTLER
VK5SX MR R W C KOPP
VK5ZF MR I M FRASER
VK6DIX MR D L SMITHDALE
VK6GRQ MR C S HEBDEN
VK6XPG MR P J GROUSE
VK6ZCY MR R B PENNO
VK6ZGA MR I C THRELFLO
VK7AEM MR A E MAIN
VK7MD MR M G FREEMAN
VK8KMA MR M A PHILLIPS

117

Monitoring RF Currents

Robert McGregor VK3XZ says this simple circuit can be put together in an hour or so.

Back in the old days RF currents were measured using a hotwire ammeter or a thermocouple ammeter. Both these instruments are rather fragile and difficult to find.

This simple circuit can be put together in an hour or so and is made from junkbox parts.

The pick-up coil can be a simple coil of about 6-8 turns of 16 swg insulated wire wound on a 12mm drill bit. The pick-up coil is placed near the helical antenna to absorb the energy radiated by the antenna.

If you want to monitor RF current in a line, wind the same number of turns on a toroidal core such as FT68-series. The line to be sampled is passed through the centre of the core to form the primary winding of the current transformer.

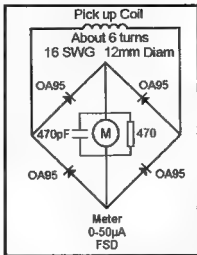
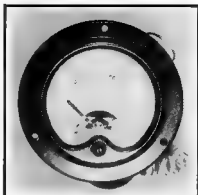


Figure 1 — RF Probe Circuit Diagram.



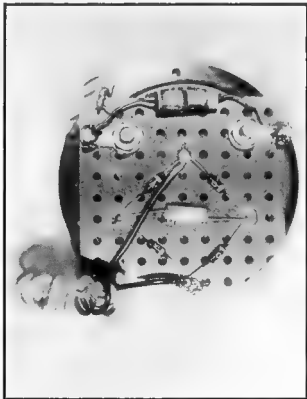
Front view of meter, components are mounted at the rear.

The photographs are of two such RF monitoring probes. Remote sampling can be achieved by joining the inner and outer of a piece of RG58 together at one end, then connect the inner to the centre pin of a BNC connector as shown. This loop can be used to monitor RF in multipliers and output stages of transmitters.

BT



RF Probe in home brew housing.



Alternate construction method — rear view of meter with components attached.

Down to Earth Antenna

Robert McGregor VK3XZ* takes an historical look at a ground aerial.

Australia and the African Desert have a common need for radio communication and a mainly sandy terrain VK5TL's letter, AR Jan '92, caused me to dig deep into a pile of ancient documents and in "Instructions to Australian Signalers" there was this piece of information for our guidance. I quote:

1. (a) A ground aerial is a length of insulated wire attached to the aerial terminal of a wireless set and laid out along the ground in the direction of the distant station. Although it lies horizontal, it radiates ground waves; it is thus an exception to the general rule that vertical aerials are used for groundwave working.
- (b) A ground aerial gives approximately the same range as a 6 ft rod.
2. (a) A ground aerial is useful in positions where a rod would be dangerously conspicuous. It may be buried to a depth of about an inch, to prevent people tripping over it, without losing much of its efficiency.
- (b) Ground aerials are less likely to screening than rods, and may provide the only means of getting communication when the sets are in woods or amongst buildings. A station using a ground aerial can work satisfactorily to a station using a rod.
3. (a) A ground aerial radiates well in the direction of its length, but very badly at right angles to its length. Ground aerials are unsuitable for large groups on account of their directive properties.
- (b) A counterpoise may sometimes be used with a ground aerial. It consists of another length of insulated wire connected to the earth terminal of the wireless set and laid out along the ground in the opposite direction to the

aerial. When a counterpoise is used, it should point towards the distant station, and the aerial in the opposite, because the radiation will probably be greater in the direction of the counterpoise than in that of the aerial.

- (c) The directivity of a ground aerial may be helpful in attaining a degree of secrecy, since little radiation is sent out at right angles to the aerial.
4. (a) The best length for a ground aerial is:— Distance in feet = $(375/\text{Frequency in MHz})$ (114.3/1MHz) metres). If a counterpoise is used, it should be about the same length.
- (b) These lengths are not critical. If the aerial is short, it will work almost as well; if it is too long, however, the efficiency will be reduced. Therefore a ground

aerial should always be made shorter than the best length rather than longer, which means it should be cut for the highest frequency that may be used.

5. Insulation — it is important that the aerial and the counterpoise (when used) should be properly insulated. The most common fault is failure to seal the end of the wire distant from the set."

I point out that in all sets referred to, the output circuit was designed to feed into something less than a quarter wavelength. An outboard series fixed condenser was normally available where the available antenna was too long. Frequencies were between 4 and 7 MHz.

Tests over this frequency range showed an average difference of 16 dB between a 6 ft rod and one of 18 ft. Beyond this height, a small capacity hat, four radial rods, 2 feet long, gave the best results.

I hope this piece of historical information is of assistance to the happy band of aerial experimenters.

*2 Wiltshire Drive Somerville Vic 3912

BT



WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Division Directory on page 3 for the address of your Division)

ANTENNAS

Ant. Compendium Vol 2 Software 5.25" IBM Disk
Antenna Collection - RSGB
Antenna Compendium Vol 1 - APRIL
Antenna Compendium Vol 2 - APRIL
Antenna Impedance Matching - APRIL
Antenna Noise Book WFB - APRIL
Antenna Pattern Worksheets Part of 10
Antennas 2nd ed John Kraus - 1988
Easy Log Antennas
G-SPR Antenna Handbook
Notice Antenna Notebook - Delaware WFB - APRIL
Physical Design of Yag - 3.5" IBM Disk
Physical Design of Yag - 3.5" IBM Disk Excel Format
Physical Design of Yag 5.25" IBM Disk
Physical Design of Yag Antennas - The Book
Practical Antenna Handbook - Lab
Predict Wire Antennas - RSGB
Reflections - Software 5 inch disk
Reflections Transmission Lines and Antennas - 5.25" IBM
Reflections Transmission Lines and Antennas - APRIL
Simple Low Cost Wire Antennas
Smith Chart Expanded Scale PK of 10
Smith Chart Diskette 1 SEI board and/or Diskette Pack of 10
Smith Chart Stand Scale 1 SEI board PK of 10
The Antenna Handbook - APRIL 1991 edition
The Easy Wire Antenna Handbook
Transmission Line Transformers - APRIL
Wire Antenna Handbook - Law - 1990
Wire Antenna Design - APRIL

ATV

An Introduction Amateur TV
Antenna - ATV Compendium - SATC
The Base of CCTV volume 2

BOOKS

Radio Cal Book Transmissions 1993
Radio Cal Book North America 1993
PICKET
CD Sheet Ship - APRIL
Death Valley OTH - APRIL
DX Blinks Center - APRIL
Golden Canyon QSO - APRIL
Munster by DRI - APRIL
SOS at Midpoint - APRIL

HANDBOOKS

Ant. Handbook - 1993
Electronics Data Book - APRIL
Mobile Radio Handbook
Notice RF Device Data - 2 Volumes
Radio Communication Handbook - RSGB
Radio Theory for Amateur Operators - Examination - 1991
Space Radio Handbook - (Glasgow) - RSGB
World Radio TV Handbook

INTEREST

200 Meters and Down 1930 - APRIL
50 Years of the 1981 - APRIL
Big Sky - Autobiography of John Kraus W8JK - 1978
Bright Spots in Radio - RSGB
Cam of Amateur Radio
Golden Classics of Yesterday - Ingham
Spark to Space - APRIL 75th Anniversary

INTERFERENCE

Interference Handbook - Nelson - 1989
Radio Frequency Interference - APRIL - 1992 Edition

MISCELLANEOUS

American Reports Complete Data Book
Design Now Book WFB - APRIL
Female Confidential Frequency Listing
Fermatagic Core Design & Application Handbook
First Steps in Radio - Doug Delmar WFB
G-SPR Circuit Handbook
Ham Radio Communications Circuit Files
Help For New Hams Delmar - APRIL
Notes and Kinks 2th Edition - 1982 APRIL
National Educational Workshop 1991 - APRIL
Hawaii Notes The Book - GST - APRIL
Radio Classics - APRIL
CRP Note Book - Delmar - APRIL
Radio Astronomy 2nd edition - John D Kraus - 1988
Radio Australia - RSGB
Radio Buyers Source Book - APRIL
Shortwave Receivers Past and Present
Short State Change - Delmar APRIL
Wireless Collectors Guide

MORSE CODE

Advanced Morse Tutor - 3.5" Disk
Advanced Morse Tutor 5.25" Disk

REF LIST PRICE

600293 \$20.00
600294 \$14.00
600103 \$22.00
600295 \$24.00
600296 \$30.00
600297 \$20.00
600298 \$3.00
600299 \$104.00
600299 \$38.25
600299 \$22.50
600102 \$16.00
600300 \$20.00
600301 \$20.00
600302 \$20.00
600303 \$20.00
600304 \$20.00
600305 \$20.00
600306 \$20.00
600307 \$20.00
600308 \$20.00
600309 \$20.00
600310 \$20.00
600311 \$20.00
600312 \$20.00
600313 \$20.00
600314 \$20.00
600315 \$20.00
600316 \$20.00
600317 \$20.00
600318 \$20.00
600319 \$20.00
600320 \$20.00
600321 \$20.00
600322 \$20.00
600323 \$20.00
600324 \$20.00
600325 \$20.00
600326 \$20.00
600327 \$20.00
600328 \$20.00
600329 \$20.00
600330 \$20.00
600331 \$20.00
600332 \$20.00
600333 \$20.00
600334 \$20.00
600335 \$20.00
600336 \$20.00
600337 \$20.00
600338 \$20.00
600339 \$20.00
600340 \$20.00
600341 \$20.00
600342 \$20.00
600343 \$20.00
600344 \$20.00
600345 \$20.00
600346 \$20.00
600347 \$20.00
600348 \$20.00
600349 \$20.00
600350 \$20.00
600351 \$20.00
600352 \$20.00
600353 \$20.00
600354 \$20.00
600355 \$20.00
600356 \$20.00
600357 \$20.00
600358 \$20.00
600359 \$20.00
600360 \$20.00
600361 \$20.00
600362 \$20.00
600363 \$20.00
600364 \$20.00
600365 \$20.00
600366 \$20.00
600367 \$20.00
600368 \$20.00
600369 \$20.00
600370 \$20.00
600371 \$20.00
600372 \$20.00
600373 \$20.00
600374 \$20.00
600375 \$20.00
600376 \$20.00
600377 \$20.00
600378 \$20.00
600379 \$20.00
600380 \$20.00
600381 \$20.00
600382 \$20.00
600383 \$20.00
600384 \$20.00
600385 \$20.00
600386 \$20.00
600387 \$20.00
600388 \$20.00
600389 \$20.00
600390 \$20.00
600391 \$20.00
600392 \$20.00
600393 \$20.00
600394 \$20.00
600395 \$20.00
600396 \$20.00
600397 \$20.00
600398 \$20.00
600399 \$20.00
600400 \$20.00
600401 \$20.00
600402 \$20.00
600403 \$20.00
600404 \$20.00
600405 \$20.00
600406 \$20.00
600407 \$20.00
600408 \$20.00
600409 \$20.00
600410 \$20.00
600411 \$20.00
600412 \$20.00
600413 \$20.00
600414 \$20.00
600415 \$20.00
600416 \$20.00
600417 \$20.00
600418 \$20.00
600419 \$20.00
600420 \$20.00
600421 \$20.00
600422 \$20.00
600423 \$20.00
600424 \$20.00
600425 \$20.00
600426 \$20.00
600427 \$20.00
600428 \$20.00
600429 \$20.00
600430 \$20.00
600431 \$20.00
600432 \$20.00
600433 \$20.00
600434 \$20.00
600435 \$20.00
600436 \$20.00
600437 \$20.00
600438 \$20.00
600439 \$20.00
600440 \$20.00
600441 \$20.00
600442 \$20.00
600443 \$20.00
600444 \$20.00
600445 \$20.00
600446 \$20.00
600447 \$20.00
600448 \$20.00
600449 \$20.00
600450 \$20.00
600451 \$20.00
600452 \$20.00
600453 \$20.00
600454 \$20.00
600455 \$20.00
600456 \$20.00
600457 \$20.00
600458 \$20.00
600459 \$20.00
600460 \$20.00
600461 \$20.00
600462 \$20.00
600463 \$20.00
600464 \$20.00
600465 \$20.00
600466 \$20.00
600467 \$20.00
600468 \$20.00
600469 \$20.00
600470 \$20.00
600471 \$20.00
600472 \$20.00
600473 \$20.00
600474 \$20.00
600475 \$20.00
600476 \$20.00
600477 \$20.00
600478 \$20.00
600479 \$20.00
600480 \$20.00
600481 \$20.00
600482 \$20.00
600483 \$20.00
600484 \$20.00
600485 \$20.00
600486 \$20.00
600487 \$20.00
600488 \$20.00
600489 \$20.00
600490 \$20.00
600491 \$20.00
600492 \$20.00
600493 \$20.00
600494 \$20.00
600495 \$20.00
600496 \$20.00
600497 \$20.00
600498 \$20.00
600499 \$20.00
600500 \$20.00
600501 \$20.00
600502 \$20.00
600503 \$20.00
600504 \$20.00
600505 \$20.00
600506 \$20.00
600507 \$20.00
600508 \$20.00
600509 \$20.00
600510 \$20.00
600511 \$20.00
600512 \$20.00
600513 \$20.00
600514 \$20.00
600515 \$20.00
600516 \$20.00
600517 \$20.00
600518 \$20.00
600519 \$20.00
600520 \$20.00
600521 \$20.00
600522 \$20.00
600523 \$20.00
600524 \$20.00
600525 \$20.00
600526 \$20.00
600527 \$20.00
600528 \$20.00
600529 \$20.00
600530 \$20.00
600531 \$20.00
600532 \$20.00
600533 \$20.00
600534 \$20.00
600535 \$20.00
600536 \$20.00
600537 \$20.00
600538 \$20.00
600539 \$20.00
600540 \$20.00
600541 \$20.00
600542 \$20.00
600543 \$20.00
600544 \$20.00
600545 \$20.00
600546 \$20.00
600547 \$20.00
600548 \$20.00
600549 \$20.00
600550 \$20.00
600551 \$20.00
600552 \$20.00
600553 \$20.00
600554 \$20.00
600555 \$20.00
600556 \$20.00
600557 \$20.00
600558 \$20.00
600559 \$20.00
600560 \$20.00
600561 \$20.00
600562 \$20.00
600563 \$20.00
600564 \$20.00
600565 \$20.00
600566 \$20.00
600567 \$20.00
600568 \$20.00
600569 \$20.00
600570 \$20.00
600571 \$20.00
600572 \$20.00
600573 \$20.00
600574 \$20.00
600575 \$20.00
600576 \$20.00
600577 \$20.00
600578 \$20.00
600579 \$20.00
600580 \$20.00
600581 \$20.00
600582 \$20.00
600583 \$20.00
600584 \$20.00
600585 \$20.00
600586 \$20.00
600587 \$20.00
600588 \$20.00
600589 \$20.00
600590 \$20.00
600591 \$20.00
600592 \$20.00
600593 \$20.00
600594 \$20.00
600595 \$20.00
600596 \$20.00
600597 \$20.00
600598 \$20.00
600599 \$20.00
600600 \$20.00
600601 \$20.00
600602 \$20.00
600603 \$20.00
600604 \$20.00
600605 \$20.00
600606 \$20.00
600607 \$20.00
600608 \$20.00
600609 \$20.00
600610 \$20.00
600611 \$20.00
600612 \$20.00
600613 \$20.00
600614 \$20.00
600615 \$20.00
600616 \$20.00
600617 \$20.00
600618 \$20.00
600619 \$20.00
600620 \$20.00
600621 \$20.00
600622 \$20.00
600623 \$20.00
600624 \$20.00
600625 \$20.00
600626 \$20.00
600627 \$20.00
600628 \$20.00
600629 \$20.00
600630 \$20.00
600631 \$20.00
600632 \$20.00
600633 \$20.00
600634 \$20.00
600635 \$20.00
600636 \$20.00
600637 \$20.00
600638 \$20.00
600639 \$20.00
600640 \$20.00
600641 \$20.00
600642 \$20.00
600643 \$20.00
600644 \$20.00
600645 \$20.00
600646 \$20.00
600647 \$20.00
600648 \$20.00
600649 \$20.00
600650 \$20.00
600651 \$20.00
600652 \$20.00
600653 \$20.00
600654 \$20.00
600655 \$20.00
600656 \$20.00
600657 \$20.00
600658 \$20.00
600659 \$20.00
600660 \$20.00
600661 \$20.00
600662 \$20.00
600663 \$20.00
600664 \$20.00
600665 \$20.00
600666 \$20.00
600667 \$20.00
600668 \$20.00
600669 \$20.00
600670 \$20.00
600671 \$20.00
600672 \$20.00
600673 \$20.00
600674 \$20.00
600675 \$20.00
600676 \$20.00
600677 \$20.00
600678 \$20.00
600679 \$20.00
600680 \$20.00
600681 \$20.00
600682 \$20.00
600683 \$20.00
600684 \$20.00
600685 \$20.00
600686 \$20.00
600687 \$20.00
600688 \$20.00
600689 \$20.00
600690 \$20.00
600691 \$20.00
600692 \$20.00
600693 \$20.00
600694 \$20.00
600695 \$20.00
600696 \$20.00
600697 \$20.00
600698 \$20.00
600699 \$20.00
600700 \$20.00
600701 \$20.00
600702 \$20.00
600703 \$20.00
600704 \$20.00
600705 \$20.00
600706 \$20.00
600707 \$20.00
600708 \$20.00
600709 \$20.00
600710 \$20.00
600711 \$20.00
600712 \$20.00
600713 \$20.00
600714 \$20.00
600715 \$20.00
600716 \$20.00
600717 \$20.00
600718 \$20.00
600719 \$20.00
600720 \$20.00
600721 \$20.00
600722 \$20.00
600723 \$20.00
600724 \$20.00
600725 \$20.00
600726 \$20.00
600727 \$20.00
600728 \$20.00
600729 \$20.00
600730 \$20.00
600731 \$20.00
600732 \$20.00
600733 \$20.00
600734 \$20.00
600735 \$20.00
600736 \$20.00
600737 \$20.00
600738 \$20.00
600739 \$20.00
600740 \$20.00
600741 \$20.00
600742 \$20.00
600743 \$20.00
600744 \$20.00
600745 \$20.00
600746 \$20.00
600747 \$20.00
600748 \$20.00
600749 \$20.00
600750 \$20.00
600751 \$20.00
600752 \$20.00
600753 \$20.00
600754 \$20.00
600755 \$20.00
600756 \$20.00
600757 \$20.00
600758 \$20.00
600759 \$20.00
600760 \$20.00
600761 \$20.00
600762 \$20.00
600763 \$20.00
600764 \$20.00
600765 \$20.00
600766 \$20.00
600767 \$20.00
600768 \$20.00
600769 \$20.00
600770 \$20.00
600771 \$20.00
600772 \$20.00
600773 \$20.00
600774 \$20.00
600775 \$20.00
600776 \$20.00
600777 \$20.00
600778 \$20.00
600779 \$20.00
600780 \$20.00
600781 \$20.00
600782 \$20.00
600783 \$20.00
600784 \$20.00
600785 \$20.00
600786 \$20.00
600787 \$20.00
600788 \$20.00
600789 \$20.00
600790 \$20.00
600791 \$20.00
600792 \$20.00
600793 \$20.00
600794 \$20.00
600795 \$20.00
600796 \$20.00
600797 \$20.00
600798 \$20.00
600799 \$20.00
600800 \$20.00
600801 \$20.00
600802 \$20.00
600803 \$20.00
600804 \$20.00
600805 \$20.00
600806 \$20.00
600807 \$20.00
600808 \$20.00
600809 \$20.00
600810 \$20.00
600811 \$20.00
600812 \$20.00
600813 \$20.00
600814 \$20.00
600815 \$20.00
600816 \$20.00
600817 \$20.00
600818 \$20.00
600819 \$20.00
600820 \$20.00
600821 \$20.00
600822 \$20.00
600823 \$20.00
600824 \$20.00
600825 \$20.00
600826 \$20.00
600827 \$20.00
600828 \$20.00
600829 \$20.00
600830 \$20.00
600831 \$20.00
600832 \$20.00
600833 \$20.00
600834 \$20.00
600835 \$20.00
600836 \$20.00
600837 \$20.00
600838 \$20.00
600839 \$20.00
600840 \$20.00
600841 \$20.00
600842 \$20.00
600843 \$20.00
600844 \$20.00
600845 \$20.00
600846 \$20.00
600847 \$20.00
600848 \$20.00
600849 \$20.00
600850 \$20.00
600851 \$20.00
600852 \$20.00
600853 \$20.00
600854 \$20.00
600855 \$20.00
600856 \$20.00
600857 \$20.00
600858 \$20.00
600859 \$20.00
600860 \$20.00
600861 \$20.00
600862 \$20.00
600863 \$20.00
600864 \$20.00
600865 \$20.00
600866 \$20.00
600867 \$20.00
600868 \$20.00
600869 \$20.00
600870 \$20.00
600871 \$20.00
600872 \$20.00
600873 \$20.00
600874 \$20.00
600875 \$20.00
600876 \$20.00
600877 \$20.00
600878 \$20.00
600879 \$20.00
600880 \$20.00
600881 \$20.00
600882 \$20.00
600883 \$20.00
600884 \$20.00
600885 \$20.00
600886 \$20.00
600887 \$20.00
600888 \$20.00
600889 \$20.00
600890 \$20.00
600891 \$20.00
600892 \$20.00
600893 \$20.00
600894 \$20.00
600895 \$20.00
600896 \$20.00
600897 \$20.00
600898 \$20.00
600899 \$20.00
600900 \$20.00
600901 \$20.00
600902 \$20.00
600903 \$20.00
600904 \$20.00
600905 \$20.00
600906 \$20.00
600907 \$20.00
600908 \$20.00
600909 \$20.00
600910 \$20.00
600911 \$20.00
600912 \$20.00
600913 \$20.00
600914 \$20.00
600915 \$20.00
600916 \$20.00
600917 \$20.00
600918 \$20.00
600919 \$20.00
600920 \$20.00
600921 \$20.00
600922 \$20.00
600923 \$20.00
600924 \$20.00
600925 \$20.00
600926 \$20.00
600927 \$20.00
600928 \$20.00
600929 \$20.00
600930 \$20.00
600931 \$20.00
600932 \$20.00
600933 \$20.00
600934 \$20.00
600935 \$20.00
600936 \$20.00
600937 \$20.00
600938 \$20.00
600939 \$20.00
600940 \$20.00
600941 \$20.00
600942 \$20.00
600943 \$20.00
600944 \$20.00
600945 \$20.00
600946 \$20.00
600947 \$20.00
600948 \$20.00
600949 \$20.00
600950 \$20.00
600951 \$20.00
600952 \$20.00
600953 \$20.00
600954 \$20.00
600955 \$20.00
600956 \$20.00
600957 \$20.00
600958 \$20.00
600959 \$20.00
600960 \$20.00
600961 \$20.00
600962 \$20.00
600963 \$20.00
600964 \$20.00
600965 \$20.00
600966 \$20.00
600967 \$20.00
600968 \$20.00
600969 \$20.00
600970 \$20.00
600971 \$20.00
600972 \$20.00
600973 \$20.00
600974 \$20.00
600975 \$20.00
600976 \$20.00
600977 \$20.00
600978 \$20.00
600979 \$20.00
600980 \$20.00
600981 \$20.00
600982 \$20.00
600983 \$20.00
600984 \$20.00
600985 \$20.00
600986 \$20.00
600987 \$20.00
600988 \$20.00
600989 \$20.00
600990 \$20.00
600991 \$20.00
600992 \$20.00
600993 \$20.00
600994 \$20.00
600995 \$20.00
600996 \$20.00
600997 \$20.00
600998 \$20.00
600999 \$20.00
601000 \$20.00
601001 \$20.00
601002 \$20.00
601003 \$20.00
601004 \$20.00
601005 \$20.00
601006 \$20.00
601007 \$20.00
601008 \$20.00
601009 \$20.00
601010 \$20.00
601011 \$20.00
601012 \$20.00
601013 \$20.00
601014 \$20.00
601015 \$20.00
601016 \$20.00
601017 \$20.00
601018 \$20.00
601019 \$20.00
601020 \$20.00
601021 \$20.00
601022 \$20.00
601023 \$20.00
601024 \$20.00
601025 \$20.00
601026 \$20.00
601027 \$20.00
601028 \$20.00
601029 \$20.00
601030 \$20.00
601031 \$20.00
601032 \$20.00
601033 \$20.00
601034 \$20.00
601035 \$20.00
601036 \$20.00
601037 \$20.00
601038 \$20.00
601039 \$20.00
601040 \$20.00
601041 \$20.00
601042 \$20.00
601043 \$20.00
601044 \$20.00
601045 \$20.00
601046 \$20.00
601047 \$20.00
601048 \$20.00
601049 \$20.00
601050 \$20.00
601051 \$20.00
60105

Random Radiators

with Ron Fisher VK3OM, and Ron Cook VK3AFW.

The Choke Balun

In a previous RR we made reference to a choke balun for use with the G5RV antenna. In this episode we evaluate that balun and discuss choke baluns generally.

Howarth Jones GW3TNP of Ferromagnetic, North Wales (UK), has kindly sent us a sample balun for use with G5RV antenna. More on this unit later.

Choke baluns or current baluns as they are sometimes called are claimed to reduce band noise, TV time base harmonic signals, and TVI by minimizing current flow on the outside of the coax cable braid. Proponents of choke baluns claim them to be superior to the more traditional "voltage baluns". Even the claim of voltage vs current difference can generate an argument, and while we will try to avoid that here we may well ruffle a few feathers.

The traditional balun is designed to provide a load with balanced voltages when driven from an unbalanced voltage source. Often an impedance transformation is achieved at the same time. The current balun in its most common form can be described as a transmission line transformer with a 1:1 ratio for voltage, impedance and current. When wound using a balanced transmission line (this might be a twisted pair of wires) it is usually considered to be a voltage 1:1 balun. The TH series of HF beams are usually fed with such a balun.

If the balun is made using coaxial cable it is called a choke or current balun. So what has changed? Not much really, only the perspective of the user.

Winding the transmission line around a ferrite or iron dust core has no effect on the line impedance if the electric and

magnetic fields of the transmission line are confined to the space between the two conductors and no field leakage occurs. This condition is well met by most coaxial transmission lines and to a fair degree by most balanced feeders with close conductor spacing.

No external field means that no interaction with magnetic or dielectric materials occurs. If the currents in both conductors are not exactly equal then they do not achieve external field cancellation. The situation can be described as the feeder carrying two balanced feeder currents in each conductor and a third unbalanced current flowing in one of the conductors. For coaxial cable this current would usually be represented as flowing on the outside of the coax. The unbalance current generates an external field and is thus susceptible to external influences such as iron cores on which the transmission line is wound.

The unbalance current has to flow through an inductance if the cable is wound around either an air core former or a ferrite rod or toroidal core. It therefore "sees" an appreciable inductance which is not seen by the balanced currents.

The simplest form of current or choke balun is simply a length of coax cable coiled up to provide a substantial inductance at the operating frequency. It is usually placed at the antenna feed point. Because the electric and magnetic fields are almost completely contained between the braid's inside surface and the inner conductor's outer surface, the coiling of the cable has no effect on the normal operation of the feeder.

If for any reason an unbalance current flows it encounters the full inductance of the coiled cable and is "choked". Thus the reason for the name, choke balun becomes obvious. The result is to force the external unbalance current to a small value and to promote better balance of the cable inner currents. The same applies for two wire line systems, however they do have some external fields near the conductors so some change in impedance of the line will occur. Choke baluns tend to be made from coaxial cable probably mainly for this reason.

Instead of winding the cable in coils which are typically 0.2 m or more in diameter and which contain about a quarter wavelength of cable at the lowest operating frequency, the coils can be wound on a ferrite rod or on a large toroid core. This reduces the physical size of the balun considerably, yet maintains the same inductance. Further, instead of winding ten turns on a core the cable can be threaded through ten cores. The result is the same except that problems of trying to bend the cable around a sharp radius are totally avoided and the average flux

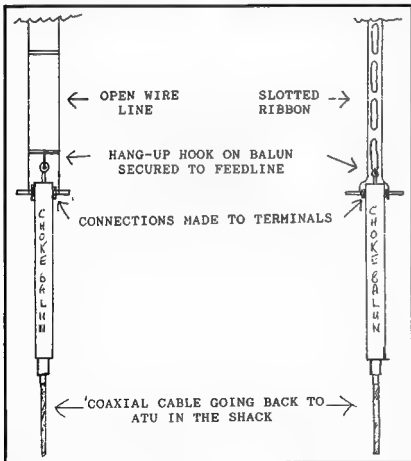


Figure 1 — G5RV Balun Connections.

level from any unbalance current is less in each core than it might be in one single core.

Unbalanced feeder currents can be produced by an asymmetric antenna, such as the Windom, by lack of symmetry in the physical arrangement of a nominally balanced antenna, by objects such as a tree near one half of a dipole and so on.

By minimizing the current that might flow down the outside of the braid, radiation from the feed line is also minimized. This reduces the probability of TVI. Just as the probability of an unbalanced radiating current is reduced so is the likelihood of external fields inducing currents in the braid which then find their way inside the coax and so to the receiver. Thus pickup from nearby noise and interference sources, especially vertically polarized ones, is reduced.

It should be apparent that, if there was no leakage from the coax braid, then putting cores or beads over the cable would not affect the impedance of the cable. Some less expensive cables have measurable leakage due to using a relatively open braid and these may exhibit a detectable impedance change. The effect should not be too serious on HF, but some of the external choke inductance will be "seen" by the inner currents.

Testing

So much for the theory. As one of the two Rons uses a G5RV on HF he was elected (by the other Ron) to test the choke balun supplied. The G5RV in question had, for many years, been fed via a coil of coax containing about 20 m

of RG213 cable. This was inclined to drop from its intended place on the side of the tower at the end of the G5RV 300 ohm feeder and be found largely uncoiled on the lawn. This occurred most frequently on the day the lawn was to be cut.

To overcome this problem, a few years back, a balun was made by winding 10 turns of RG58CU around the core of a TV EHT transformer, but it was never weather proofed and hence never permanently installed. The arrival of the choke balun presented an opportunity to compare the three approaches. Because the coax coil was tied to the side of the tower, and so could be coupled to any stray currents in the tower, it was expected that the other baluns would be better: this in fact proved to be the case.

The two cored baluns were fed from a 3 m long length of RG213 cable.

The results are shown in the graphs.

The straight coax balun gave different SWR values to the coil of coax but generally very similar results to the homebrew balun. Generally the coil of coax gave lower VSWR, suggesting higher losses, perhaps in part due to interaction with the tower body, resulting in inadequate balun operation. Higher losses could be expected from the additional 20 metres of cable. The homebrew balun gave a much higher VSWR on 10 metres for reasons unknown. With the commercial unit in place the station Kenwood AT250 ATU was able to produce a match better than 1.3:1 on all frequencies inside the allocated bands except on 10 MHz. The ATU could not match properly with the home brew unit on 7 MHz and 10 MHz. This difference is attributed to the different effective cable lengths in the two units.

No graphs are provided for 10 MHz, 18 MHz and 24 MHz because the VSWR did not change across these bands.

On 10 MHz the coaxial coil gave 5:1, and both current baluns gave 100% reflected power. On 18 MHz the coaxial coil gave 5:1 again but the Ferromagnetic balun gave 9:1 and the home brew unit gave 100% reflected power. On 24 MHz the coil gave 1.6:1, and both the current baluns gave 1.9:1.

In this particular installation, no reduction in noise level was noticed.

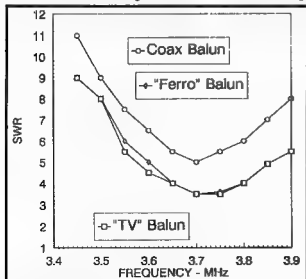
The Ferromagnetics balun is compact and well made. Installation is very easy. The support hook and two feeder terminals are made from stainless steel and the rest of the unit is sleeved in heat-shrink tubing to provide a waterproof assembly. An SO239 connector allows easy connection of the coax feeder.

It is an excellent unit and recommended for consideration for any G5RV or dipole installation.

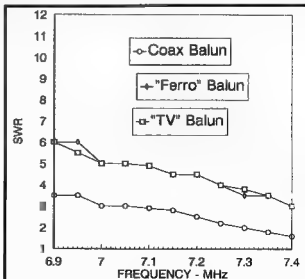
The manufacturer's specifications are as follows.

Frequency Coverage:	1.7 — 30 MHz
Input Impedance:	50 ohms
Input Connector:	Mil spec SO239
Series Z to the screen over:	Better than 1500
Insertion Loss:	ohms at maximum
Power Handling:	0.01 dB
Weight:	2 kW +
	8.5 oz, 240 grams

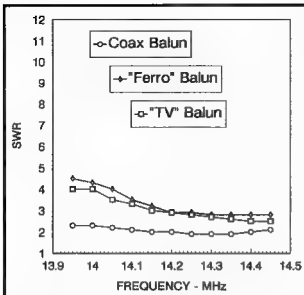
The sketch in Figure 1 shows the balun connected to and suspended from the matching section. You can do just that, or if the bottom end of the matching section comes within 5 or 6 feet of the ground, a post can be put into the ground at that point, and the balun can be fixed to that, so taking the weight off the matching section.



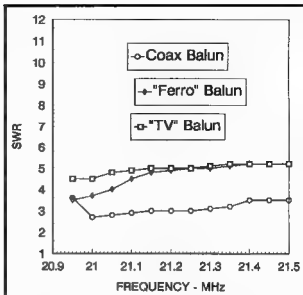
Graph 1 — SWR of G5RV on 80 m for 3 baluns.



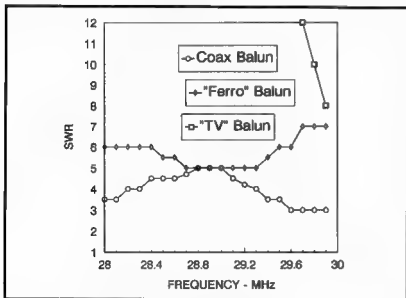
Graph 2 — SWR of G5RV on 40 m for 3 baluns.



Graph 3 — SWR of G5RV on 20 m for 3 baluns



Graph 4 — SWR of G5RV on 15 m for 3 baluns.



Graph 5 — SWR of G5RV on 10 m for 3 baluns.

Bill Orr Revisits the G5RV

In the 1992 November issue of CQ magazine, Bill Orr W6SAI revisits the G5RV. He describes how the antenna was devised by Reg Varney G5RV to operate on 20 m. It was fed with 34 feet of 450 ohm open wire line and 80 ohm coax. It functioned quite well on other bands when an ATU was employed at the transmitter. When adopted by the Americans, 300 ohm TV feeder was used as a substitute for the open wire line, an appropriate reduction of length being

necessary to maintain an electrical half wave on 20 m, and 50 ohm coax line was used for the rest. When measurements were made with a VSWR meter the reasons for problems with loading on some bands became apparent.

Bill decided to check out the G5RV along with a current balun similar to that described earlier in this article. He installed a G5RV with the centre at 45 feet and the ends were held at 30 feet. The G5RV used by this Ron is 40 feet high at the centre and 15 feet high at the ends. His results are given in the following table.

As can be seen his results are similar to those achieved with the Ferromagnetics balun.

Bill noted that noise bridge and VSWR meter readings did not match until he fitted more ferrite beads over the coax at the shack end of the cable. He used 6 type 43 beads, Amidon #43-1024.

Presumably there was still some rf pick-up on the coax outer which would appear to be open circuited at the top. Perhaps the earthing was less than optimum.

His conclusions were:

1. A current type 1:1 balun should be used to connect the ribbon line to the 50 ohm coax.
2. Placement of the coax feedline with relation to the antenna is critical, and SWR will change with position.
3. If the G5RV is slung from a yardarm on a metal tower, the ribbon line should be spaced at least 3 feet clear of the tower.
4. A good match on any one band can be made by shortening or lengthening the ribbon line a few inches at a time. But this advantage is only achieved by a poorer match on some other band.
5. The SWR cannot be changed by changing coax length if the line is properly decoupled from the field of the antenna, but the impedance at the station end of the line can be altered by varying line length to provide the best match to the transmitter. If the SWR at the transmitter changes when the line length is changed, it is an indication that there is coupling between the outer shield of the line, and the antenna. Groups of ferrite

Band	Freq.	SWR	Band	Freq.	SWR
80 m	3.5	6.3	10 m	28.0	4.83
	3.6	4.98		28.2	4.81
	3.7	4.47		28.4	4.42
	3.8	4.66		28.6	3.99
	3.9	4.76		28.8	3.64
	4.0	5.67		29.0	3.34
40 m	7.0	2.65		29.2	2.58
	7.1	3.05		29.4	2.29
	7.2	3.67		29.6	1.94
	7.3	4.50		29.7	1.88
	14.00	1.83	WARC Bands		
20 m	14.10	2.15	30	10.1	8.50
	14.20	2.64	17	18.11	1.84
	14.35	3.20	12	24.95	4.52
	21.00	5.90	Representative		
15 m	21.10	5.86	G5RV Antenna		
	21.20	5.71			
	21.30	5.66			
	21.45	5.69			

Table 1 — Results of the G5RV checks on all bands (including 10 MHz).

Band	Freq.	SWR	Band	Freq.	SWR
80 m	3.5	7.68	10 m	28.0	3.38
	3.6	6.26		28.2	3.49
	3.7	5.25		28.4	2.92
	3.8	4.43		28.6	2.53
	3.9	4.36		28.8	2.11
	4.0	4.60		29.0	1.69
40 m	7.0	1.72		29.2	1.48
	7.1	1.95		29.4	1.68
	7.2	2.77		29.6	2.40
	7.3	3.00		29.7	2.55
	14.0	2.50	WARC Bands		
20 m	14.1	2.20	30	10.1	8.11
	14.2	1.76	17	18.11	1.11
	14.3	1.38	12	24.95	2.75
	14.35	1.42	Representative		
15 m	21.00	4.96	W6SAI Antenna		
	21.10	4.94			
	21.20	4.72			
	21.30	4.70			
	21.45	4.70			

Table 2 — SWR data for the 40, 20, and 10 metre bands for the W6SAI version of the G5RV.

- slugs placed along the line intervals will help reduce this effect if it annoys you
- Tube type rigs with an adjustable output circuit have greater loading range than do solid-state transmitters. In many cases the tube-type rig can be used with the G5RV without requiring an auxiliary ATU.
 - It is a good idea to decouple the outside of the line at your transmitter. Do this by slipping six ferrite beads over the coax shield before you place the plug on the line. Type 43 beads (Amidon #43-1024 for RG-8 coax) will do the job (Use Amidon #77-1024 for RG-58 coax)
 - Finally, the G5RV functions as an "all band" antenna (less the WARC

bands), but an ATU is usually necessary unless a lot of time-consuming pruning and trimming of the ribbon is done. Even then, transmitter matching at the station will only improve one band at the expense of another.

Bottom line: The G5RV is a popular antenna and a lot of DX can be worked with it. It has a little gain over dipole on the higher bands, but not much. If you have a modern rig, be prepared to buy an ATU to make the antenna work properly (unless your rig has an ATU in it).

Incidentally, back in January 1989, Don VK1DK published an article in AR in which he calculated the VSWR of a G5RV antenna in free space. His results, reproduced below resemble those found by the practical tests reported here.

VSWR of G5RV as calculated by VK1DK

Frequency MHz	VK1DK VSWR
3.6	3.3 : 1
7.2	10 : 1
10.1	68 : 1
14.2	2.5 : 1
18.1	49 : 1
21.2	12 : 1
24.9	2.8 : 1
28.5	83 : 1

It should be noted that any calculation involves making certain assumptions which may not be fully achievable in practice. Also the measurement of VSWR involves using imperfect instruments in less than ideal testing conditions, giving rise to some uncertainty about the recorded values. So agreement to a few percent should not be expected, rather the trends, such as low VSWR on 14 and very high VSWR on 10 MHz are as much as can be expected. The effect of the environment can change measured results for the better as well as for the worse.

Yet Another Design for a G5RV

Someone is always trying to build a better "G5RV" and in the same article referred to earlier, Bill reports on a version from ZS6BKW. This is 10 feet shorter overall, 92 feet instead of 102 feet. Bill made up one as shown in Figure 2. The results are noticeably better but not a great improvement and an ATU would still be necessary on most bands.

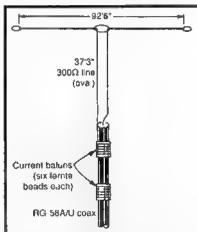


Figure 2 — The W6SAI version of the ZS6BKW version of the G5RV antenna. Normal details covering waterproofing of coax to ribbon connection apply.

Well that's it until next time, so its 73 from me and 73 from him

The two Rons
ar

WIA Policy Revamps

Continuing with publication of the 12 revamped Federal Policy items, commenced in last month's WIA News, this month we present the last three in the series.

EDUCATION

This Board CONSIDERING:

The requirement for technical and radio regulation examinations as a prerequisite to issue of an amateur licence; The requirement for Morse code examinations for some grades of amateur licence;

The need to maintain an adequate level of entry standard to the amateur service;

The need to stimulate existing licensees to continue their training post licence level;

The need to attain and maintain a high standard of operating procedures;

The continuance of amateur radio relies heavily on adequate education of new members.

This Board RESOLVES that: Negotiations continue with DOTS to ensure the statement of syllabus for each examination is regularly revised and maintained up to date;

The WIA establish an adequate training program for instructors;

The WIA prepare and make available to instructors adequate study guides and education packages for each grade of licence;

Divisions be exhorted to prepare and maintain training programs designed to assist intending licensees to:

Pass various grades of licence examinations in theory;

Create an awareness of the heritage and responsibilities of the amateur service; Encourage amateurs to extend their knowledge past that required for a licence;

Assist new licensees to acquire good operating habits and an understanding of self regulatory procedures.

References: 82.092/1 Appx C5

Previous version: 82.092/1 Appx C5 Revised Jun 92 & Jul 92 Board meeting Adopted: Oct 92 Board meeting.

CONCESSIONAL MEMBERSHIP

This Board NOTING:

Membership grades are determined by Divisions through their respective constitutions and include some or all of

full, associate, country full, country associate, pensioner, family and student grades.

At an Extraordinary Convention in June 1989, Federal Council in considering the effort required to service each membership grade, RESOLVED (89.06.03/EC):

1. To recommend 2 grades of Federal membership subscription component, namely full grade and a concessional grade applicable to all members in all Divisions.

3. There will be a concessional rate available at a discount of 20% for the categories defined below.

A: Existing pensioner members:

B: Members in receipt of a full pensioner health benefits card:

C: Needy members, whose financial circumstances are not better than those persons eligible for a full pensioner benefit card, upon application to the relevant Division:

D: Student members:

E: Family members, for second or subsequent members residing at the same address. Family members do not receive AR.

4. That the discount be split proportionally between Executive and Divisional components, except that the discount applicable to members who do not receive AR, shall be borne by Executive.

8. For practical reasons, the actual sum payable may be rounded off.

[Resolution 89.06.03/EC Items 2, 5, 6 & 7, which refer to actual subscription rates, implementation dates, automatic annual adjustments tied to CPI and recovery of shortfalls are now all superseded by later resolutions.]

At a meeting on 24 Oct 89, Federal Executive agreed a no Amateur Radio magazine membership grade would be offered (89.1001)

Federal Office accepts and actions members' requests for reclassification to pensioner concession grade where satisfactory documentary evidence is provided and advises Divisions post the event.(90.10.02/EC)

Federal Council has defined a student eligible for concessional membership as a full time student under the age of 25. (90.10.02/EC)

Federal Office seeks re-confirmation of existing student membership status annually with the renewal notice. New applicants are required to establish their

eligibility with their Division. (90.10.02/EC).

Requests for "needy" concessional membership are referred to the appropriate Division for a decision.(90.10.02/EC)

This Board RE-AFFIRMS:

Only two levels of Federal membership subscription component will apply, full and concessional.

Concessional membership will be at a discount of 20% split proportionately between Federal and the Division.

Applications with documentary evidence for change to concessional membership on pensioner grounds will be processed by the Federal Office and Divisions advised in their routine monthly returns.

New applications for concessional membership as a student will be processed after validation by the Division concerned. Renewal notices will be accompanied by a request for confirmation of student status.

A no Amateur Radio magazine subscription will be made available, by deducting the cost of the magazine component plus an administrative fee from the relevant subscription component.

References: 89.06.03/EC 89.1001 90.10.02/EC 91.02.03/EC.

Previous version: 82.092/1 Appendix C1 Revised: Sep 92 & Oct 92 Board meeting

Adopted: Oct 92 Board meeting.

PUBLIC RELATIONS

This Board NOTING.

The public image of amateur radio is poor;

There is no Federal co-ordination of efforts to improve this image; Opportunities are being lost from this lack of co-ordination.

This Board RESOLVES that:

A public relations program be prepared by a co-ordinator, either professional or volunteer;

The program, including budgeting estimates, to be presented annually, to the Board for ratification;

The Divisions be encouraged to appoint their own Public Relations Officers who will be urged to exchange information amongst themselves for maximal exploitation of opportunities as they present.

References:

Previous version: 82.106/1 Appendix D2 Revised: Sep 92 by VK4AOK

Adopted: Oct 92 Board meeting.

DICK SMITH ELECTRONICS

YAESU SAVINGS



2 Year Warranty

FT-212RH MOBILE 2m FM TRANSCEIVER

The FT-212RH is a compact mobile FM transceiver that can also double as an easy-to-use base station. Provides 45-watt output over the 144-148MHz range, with a rugged die-cast chassis for superb RF isolation and extensive use of surface-mount components for greater reliability. What's more, it has a large back-lit LCD with bargraph PDS-meter, 5 selectable tuning steps and a total of 21 memories (18 general purpose, 1 call channel and 2 sub-band limit memories for band scanning). As well there's built-in CTCSS encode and a variety of scanning functions. Complete with mobile mounting bracket, MH-14A8 hand microphone and DC power lead.

Call D 3494

SAVE \$70 \$499*

*Hurry, special ends 31st May '93



Limited Stocks - only 10 available!

FT-990 DC VERSION

(Requires 13.8V)

Cat D-3255

2 Year Warranty

FT-990 H.F. ALL-MODE BASE TRANSCEIVER

The FT-990 offers many of the advanced features of the legendary FT-1000, yet in a more compact and economical base-station package. Its excellent front-panel layout, together with clear labelling, a large back-lit meter and an uncluttered digital display provides very straightforward operation. The receiver performance is excellent, with a wide dynamic range front-end circuit and two DDS's providing a very low noise level and excellent sensitivity over the 100kHz to 30MHz range. Transmitter output is 100W on all HF Amateur bands (SSB, CW, FM) with high duty cycle transmissions allowed.

An internal auto antenna tuner with 39 memories is a standard feature, while the customizable RF speech processor and Switched Capacitance Audio filtering facilities are unique to the FT-990. Other features include IF Shift and IF Notch, IF bandwidth selection, an effective adjustable notch filter, 500Hz BAW CW filter, 90 memories and one-touch band selection. Microphone optional extra.

SAVE \$200 Only \$2995

NSW • Albany 21 8399 • Bankstown Square 707 4888 • Blacktown 671 7722 • Brookvale 905 0441 • Bondi 387 1444 • Campbelltown 27 2159 • Chalfont Chase 411 1955 • Chippinga 642 8922 • Gore Hill 438 5311 • Gosford 25 0235 • Hornsby 477 6633 • Hurstville 580 8622 • Kotara 56 2092 • Liverpool 600 9888 • Maitland 33 7866 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3855 • North Sydney Greenwood Plaza 964 9467 • Orange 618 400 • Parramatta 688 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 ACT • Belconnen (06) 253 1785 • Epping 280 4944 VIC • Baird 31 5433 • Bendigo 43 0388 • Box Hill 890 0659 • Coburg 383 4455 • Dandenong 754 9377 • East Brighton 592 2366 • Essendon 379 7444 • Footscray 889 2035 • Frankston 783 9144 • Geelong 232 7111 • Melbourne City 349 8248 • Elizabeth St 325 6088 • 246 Bourke St 639 0396 • Richmond 428 1614 • Ringwood 879 5338 • Springvale 547 0527 QLD • Booda 282 6200 • Brisbane City 229 9377 • Bundamba 391 6233 • Cairns 311 515 • Capalaba 245 2870 • Chermside 359 8255 • Maroochydore 791 800 • Rockhampton 27 9844 • Southport 32 9033 • Toowoomba 38 4200 • Townsville 72 5722 • Underwood 341 0844 • SA • Adelaide City 232 1200 • Beverley 347 1900 • Elizabeth 255 8999 • Enfield 260 6088 • St. Marys 277 6977 WA • Cannington 451 8665 • Fremantle 335 9733 • Perth City 481 3261 • Midland 250 1460 • Northbridge 328 6944 TAS • Hobart 31 0800 • Launceston 344 55 NY • Darwin 81 1977 STORES ACROSS AUSTRALIA AND NEW ZEALAND

Technical Abstracts

Gil Sones VK3AUI looks at interesting technical ideas from other publications.

Doppler Direction Finding

We are all familiar with using a directional yagi or other unidirectional antenna to DF a hidden transmitter or interference source. The bearing obtained is not very accurate due to the relatively broad pattern. This may not matter in a conventional transmitter hunt.

There is however a system which uses switched aeriels which is capable of much greater accuracy albeit with a possible 180 degree ambiguity. There is an advantage in that a simple FM receiver or a handheld can be used as the DF receiver. The ambiguity can be resolved by taking successive bearings from different positions on a baseline. A procedure used on HF with a DF loop.

The aeriels are switched rapidly at an audio rate. This causes phase modulation of the signal at the audio rate due to the

slightly different path lengths to each aerial. See Figure 1. This is detected easily on an FM receiver such as a handheld or scanner. The null will be very sharp.

More complex systems can be built which use the audio signal to drive a directional indicator. However the ear is a pretty good detector and the brain is quite good at sorting out all sorts of variations in the signal. A manually rotated antenna together with an experienced operator is hard to beat.

The system is not new and was described in July 1981 in QST as the Double Duck Direction Finder and the DoppleScAnt in May 1978 QST. These articles describe a manual system and a directional display system respectively. Simple systems using a pair of helical dipoles and using the operator's ears to detect the null have been described in *Radio ZS Nov/Dec 1990* reprinted in *Rad Comm* April 1991 and a design from Scotland published in *Technical Topics* in *Rad Comm* July 1991. Both use helical dipoles as the two antenna elements. This gets over the problem of rotating a fairly large ground plane. The antenna array is smaller than the usual fox hunt beam.

The design data for suitable helical dipoles can be found in the *RSGB Handbook Volume 2*. The antenna should be dipped and adjusted onto frequency after being built from the tables. A most important step if the design is modified.

The *Radio ZS* design by John Williscroft ZS6EF is notable in the use of switched FET RF Amps to switch between the aeriels. This avoids the use of PIN diodes

which may be hard to obtain. It does however limit the aerial to reception so you have to avoid prassing the PTT. The circuit is shown in Figure 2. The FETs can be any VHF dual gate FET.

The *Rad Comm* July 1991 design by Dave Plumridge G3KMG as shown in *Technical Topics* uses diode switching between the aeriels. The aeriels are however helical dipoles.

The antenna array is built from plastic conduit and wooden dowel. See Figure 3. The helical dipoles consist of 82 turns of 0.8 or 1.1 mm wire evenly spaced on a 450mm long 6mm wooden dowel former. The coupling to the feeder is by a 5 turn link at the centre of the helical dipole. The feeders from each aerial must be of equal length. The array is shown in Figure 2. The ariel element construction is shown in Figure 4. The aeriels are dipped onto frequency by coupling a dipper to the exact centre of each helical dipole.

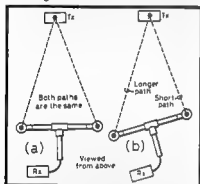


Figure 1 Doppler DF Principle.
(a) Equal path lengths give in phase signals.
(b) Unequal path lengths give different phase modulated by switching signal.

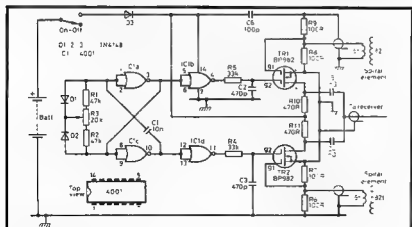


Figure 2 Electronic Switch and FET Preamps. Build into junction box at array centre.

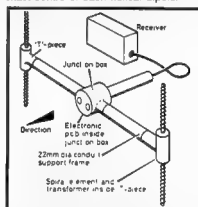


Figure 3 ZS6EF Doppler DF.

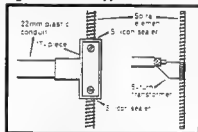


Figure 4 Spiral Element and Transformer.

With some experience accurate bearings can be obtained. Multipath signals will show up as odd audio effects. The null of the fundamental audio tone is very sharp. However by moving and averaging results it should be possible to resolve most problems that would have display systems dissolve into a shimmering mess of flickering LEDs.

The use of such systems may help those with repeater problems far more than inaccurate beam headings and guess-meter reports.

A Packet of Packet

Kevin Olds VK1OK *

Things have been a bit quiet for me personally on the Packet front lately, one of those situations where work and other hobbies have taken precedence. In conjunction with those who have been helping me by providing material for this column, we have been mapping out possibilities for future columns. Our greatest problem is in feed back from you the readers to help us know what you want to see.

In the last column I featured an item by Hugh Blemings VK1YYZ on Digital Signal Processing or DSP. This month Warren Toomey, VK1XWT describes an application of DSP to the amateur packet scene in the form of a radio modem, the DSP4 Project. Now over to Warren.

Introduction

The DSP4 project is the fourth DSP project designed by two Finnish amateurs, Kaj Wilik OH6EH and Jarkko Vuori OH2LNS. The project is a simple and flexible one which is ideally suited to the needs of amateurs.

Overview

The block diagram of the DSP4 project is shown in Figure 1.

The heart of DSP4 is the Motorola DSP56001 processor, which performs all of the signal processing. Internally, it has three functional units which work in parallel — the Data ALU, the Address ALU and the Program Controller. This

parallelism gives the 56001 a great deal of processing power: a 24x24 bit multiplication, a 56-bit addition, rounding, two data moves and two address pointer updates can all be performed in one 74.1 ns instruction cycle. The 56001 also has many built-in I/O interfaces, allowing the DSP4 to be built with very few other components.

The 56001 is supported by 96kB of static RAM, half used for program storage, and the other half for data storage. A 256kB EPROM is used to store programs permanently (i.e. across power downs): the EPROM can either be a standard one or a FLASH EPROM; the latter allows you to alter the EPROM contents without pulling the chip out and "burning" the program in as is usually the case. You can also download new programs into the RAM at any time, but they will be lost when the power is lost.

The Analog/Digital and Digital/Analog conversion is done by the Crystal Semiconductor's CS4215 16-bit Stereo Codec. It has a top sampling rate of 48 kHz, giving the system a bandwidth of around 20 kHz and a S/N ratio of around 100dB — CD quality. The Codec also provides amplifiers for speaker, headphone and line output, and microphone and line-level inputs. Note that the DSP56001 does its processing on 24-bit values, which means no accuracy is lost with the Codec's 16-bit samples.

The DSP4 project provides two forms of digital I/O. The MAX232A and

MCL2730 chips provide a standard RS-232 which is optocoupled to the processor, with a top data rate of 116 kbps in asynchronous mode, and up to 3.3 Mbps in synchronous mode. As well, eight general purpose TTL-level outputs and four TTL-level inputs are provided, which are diode protected for inductive loads on output and overvoltage conditions on input.

Lastly, two minor but important components of the DSP4 are the power supply and watchdog circuit. The power supply is a switched-mode one designed around the MAX738 chip, which provides all of the voltages required for the board from a 6 to 16 V DC supply. The total power requirements of the DSP4 is 3 Watts. The watchdog circuit is built around the MAX1232 watchdog chip, which must be "licked" by the software every second or the chip resets the processor. This sounds great for those remote hilltop sites.

Software

The beauty of a DSP project is that the functions you can perform with it are only limited by the software you have available for it. Currently Kaj and Jarkko have software to transform the DSP4 into a 1200-baud packet radio TNC in KISS mode, and a 9600-baud G3RUH-type packet radio TNC in KISS mode.

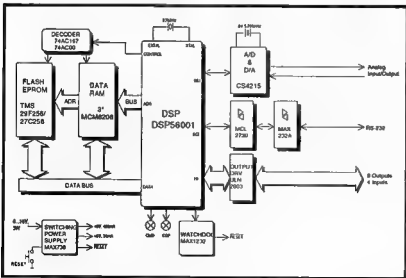


Figure 1 Block Diagram of the DSP4 Project.

ELECTRONIC DISPOSALS

27 THE MALL SOUTH CROYDON

Specials.

3 watt ceramic resistors 10c each
40 amp 12 V relays single throw \$1
5A Bi Metal cut outs 35c each
CB/10m end fed mobile ant comes
complete with coax and mount
\$12.00

Mains caps 240 v \$1.00 each
ECL — ICs 10,000 series \$3.50 per
tube

2716 70c each or \$1.00 per tube
9016 16k x \$12 per tube
TL082 Low noise op amp \$1 each
10 µF 40 v low leakage Electrolytics
\$6 per 100

2200 µF 50 V axial 90c each plus
lots components at reduced rates

KITS (OR PARTS, BOARD, ETC.)
AVAILABLE FOR DREW DIAMOND'S
PROJECTS

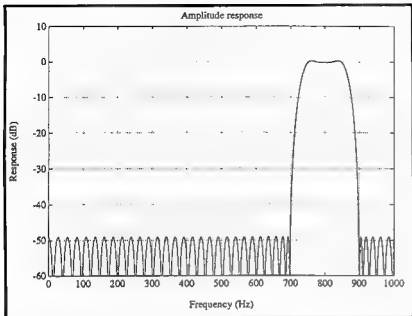


Figure 2 Frequency Response of CW Bandpass Filter.

Remember, because all of the signal processing is done in software, you can change from 1200 baud transmission to 9600 baud transmission in seconds, with not a single wiring change! Kaj and Jarkko plan to rewrite software from their previous DSP projects for the DSP4.

Although these are the only pieces of software currently available for the DSP4, I can think of a variety of applications for the project:

- Precision AF signal generator of any waveform you can think of.
- AF spectrum analyser.
- AF frequency counter.
- SSTV and FAX encoder/decoder.
- RTTY decoder/encoder at any data rates and frequency shifts.
- Third-octave (or better) programmable stereo graphic equaliser.
- Speech compressor.
- Special effects for those musicians in our ranks: chorus, flanger, echo, reverb, phaser etc.

The list is endless! As an example, Kaj and Jarkko describe a CW filter designed in software which is centred at 800 Hz and has a bandwidth of approximately 200 Hz. Software filters can be designed that could never be accomplished by analog ones: this CW filter is a 320-pole (yes, 320!) one with linear phase response over the pass bandwidth. The frequency response is shown in Figure 2.

All of the software written for the DSP4 project is freely available, as are the support tools (compiler, assembler, linker, simulator) from Motorola, and a wide range of software library routines such as

Fast Fourier Transforms is also available from Motorola. The only problem is that you need to program deviously to get those three sections of the 56001 processor to all be occupied at the same time!

Hardware

The hardware of the DSP4 is fairly minimal and fits on a 160mm x 100mm four-layer card, with only twelve chips on it, plus about forty capacitors and resistors. The PCB has four layers because the designers found noise to be a problem on two layer boards.

Current State and Cost

At the time of writing, the schematics for the DSP4 project have been released by Kaj and Jarkko, but they are still fine tuning the PCB layout, although their prototypes are working quite well, from all accounts. As soon as they are happy with the PCB layout they will release the photoplots for them.

None of the chips on the DSP4 are cheap, and getting four-layer PCBs manufactured won't be cheap, either. At the moment I know of around two dozen amateurs in Australia who are interested in the project, and the more that become interested, the cheaper the chips and PCBs. A rough price estimate is that building the DSP4 will put you back \$300 to \$600. That might cause some grief to your back pocket until you realise you are getting at least two TNCs for that price, as well as any other programs that come along for the board — I'm very interested in getting a 4800-baud HAPN package written as well.

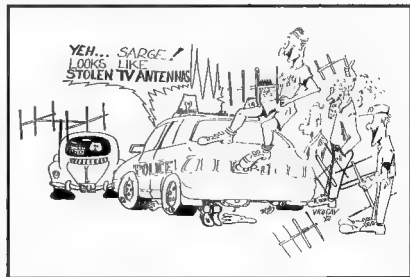
If you are interested in building the DSP4 project, please send me some mail at my QTHR. Once we have the PCB design and a firm number of financially interested people, we can begin to get firm quotes for chips and PCB production.

Conclusion

The DSP4 is an elegant and mostly affordable Digital Signal Processing project admirably suited for amateur radio applications. I'd like to thank Kaj Wiik OH6EH and Jarkko Vuori OH2LNS for all the hard work they have put in and for their happiness to make their designs freely available to the amateur community.

* 238 Southern Cross Drive, Latham ACT 2615

MF



Repeater Link

Will McGhie VK6UU *

A Saga

Repeaters can be interesting to maintain. Many repeater managers could tell a story or two, on the difficulty of being responsible for equipment that is many kilometres away on mountain tops, in difficult to get to locations. When a problem occurs with a remote repeater, even getting to the site can greatly add to the delay in repair. If the fault condition is intermittent, or will not show up while you are on site, added time is required to effect repairs. What follows is not unique, but may serve to emphasise the interesting nature of maintaining a repeater.

A recent fault with VK6RUF, our UHF voice repeater in Perth, proved to be an interesting one.

The symptom was, after a few minutes of operation the transmitter would stop transmitting. On closer investigation it was found that the transmitter was not altogether dead, just low power, about 1 mW. After a minute or so the transmitter would come on again for a short time, and then cycle between on and off; more off than on. The fault was traced to the exciter in the frequency multiplier stage, by checking the test points along the multiplier stages.

The fault was not mechanical, in that striking any part of the exciter or any other part of the transmitter, had no effect on the fault condition. The fault was temperature related. After a few minutes of operation the transmitter would go to low power. Circuit chiller applied to the multiplier stage would instantly bring the transmitter up to full power.

Hair Drier to the Rescue (?)

To speed things up, a hair drier was used to heat up the multiplier stage, to bring on the fault condition after the circuit chiller was used. This is where it became interesting. The fault could not be bought on! No matter how hot the multiplier was made by the hair drier, the transmitter power remained steadfastly at full power. Repeated cooling by the circuit chiller, and heating by the hair drier could not bring on the fault.

Was there a fault anymore or not? Leaving the transmitter to cool down to room temperature, and then turning it on, confirmed that the fault had not gone away. After several minutes of operation the transmitter would go to low power. The component that bought the transmitter back to life when chilled, was a transistor in the exciter multiplier stage. The

smallest drop of circuit chiller on this transistor and the fault would go away, but why would heating the transistor with the hair drier not bring the fault on again? Even more to the point, once heated by the hair drier, the fault would not show up when the hair drier was removed, and the transmitter left on for an hour or more.

Temperature Probe

A temperature probe was placed on the transistor and from room temperature the rise in temperature was observed from switch on. At 52 degrees Celsius the transmitter failed, and then the temperature of the transistor slowly dropped until at 46 degrees the transmitter turned on again. The transistor would then heat up again and so repeat the cycle, off at 52 and on at 46.

Short of an explanation it was time to replace the heat sensitive component. Once replaced the transmitter was turned on from cold, and with temperature probe in place, watched. At 52 degrees Celsius off went the transmitter and the whole lot went in the bin!

*"After my little tantrum
the transmitter was
retrieved from the bin
and placed back on the
bench."*

Tantrum didn't help!

After my little tantrum the transmitter was retrieved from the bin and placed back on the bench. If it was not the heat sensitive transistor, then what was the problem? Why would the hair drier not duplicate the problem?

I don't know when the idea began to form, but could the fault only be over a narrow range of temperature? This would explain why, when heated by the hair drier to a very hot temperature, the transmitter would remain on with no fault. Put another way, below a certain temperature the transmitter worked, and above a certain temperature the transmitter worked, but for a range of temperature it would not.

The temperature probe was placed on the transistor and the transmitter turned on. Once the magic 52 degrees was reached, off went the transmitter. Without letting the transistor start to cool (why it would cool down at this point was also unanswered) heat was applied slowly

from the hair drier, and at 54 degrees the transmitter came on again! Removing the hair drier saw the temperature of the transistor continue to rise to about 60 degrees and stabilise. The transmitter remained on. Part of the mystery was solved, but why would heating the transistor with the hair drier from cold through 52 to 54 degrees, not bring on the fault?

The answer was the rate of temperature rise the hair drier could achieve. The transition through 52 to 54 degrees was so fast, that the transmitter would only switch off for a very short time, too short to notice. This was confirmed by applying heat from the hair drier slowly, at 52 degrees off went the transmitter. Heating the transistor quickly through 52 degrees produced no observable fault. A few answers but what was the fault?

With no idea what to do next I decided to go through the exciter and line up the multiplier stages. This was simple enough, as there are test points at each stage, and you just tune for a maximum voltage reading. With this done the transmitter was turned on from cold. No fault occurred at 52 degrees! No amount of temperature change would cause the fault to occur.

My conclusion as to what was happening is. The tuned circuit feeding the heat sensitive transistor was close to being off frequency. At the 52 degree point, the transistor reflected a small change in its input impedance to the tuned circuit, to further pull the tuned circuit off frequency. The base to emitter capacitive reactance changes slightly with temperature, and this change was enough to affect the tuned circuit, and maybe the operation of the previous multiplier stage.

Jenlex Manufacturer of All Types of R.F. Filters

L.C. Band Pass
L.C. Band Stop
Hi & Lo Pass Filters
Helicals — Band Pass & Stop
Cavity Resonator — Band Pass
& Notch

122 Wanda Street Mulgrave
Victoria 3170

Phone: (03) 548 2594

Fax: (03) 547 8545

Frequency multiplier stages are class C devices, and the transition between operating correctly and not can be very sudden. This shows up when tuning up a frequency multiplier strip. Very little change in tuning can result in no output from the transmitter, as other multiplier stages further on receive less drive and produce far less frequency multiplied output. Class C operation requires a minimum drive level to work, particularly when frequency multiplying. It is a domino effect from full transmitter output to none. Anyway that is my theory. I had lost interest in any further investigation, as the repeater had been out of service for over a week.

Possible Answer

The explanation as to why the transistor cooled down after the fault had occurred, was due to lack of drive from the previous stage. If the temperature sensitive transistor was reflecting a load change back to the previous multiplier stage, to reduce its frequency multiplied output, then our heat sensitive transistor was then receiving insufficient drive to operate in class C, and it would stop drawing current and cool down. It's the only answer I have come up with.

If the fault occurs again, then all this supposition could be wrong, and the investigation starts all over.

This description is a condensed version, as there were three trips to the repeater site. The first one, to find that the fault would not occur on the bench at the repeater site, so the equipment was returned to operation, only to fail again. The second visit armed with circuit chiller and hair drier, only to be confused by the results, so the repeater was bought home. Much heating and cooling at home produced no fault, so the repeater was returned to the site, only to fail yet again. The third visit to bring it back to the work bench for a fix at all cost.

Time taken for repair 6 hours. Travel time 3 hours. Distance travelled 130 Kilometres.

There must be many a story better than this one, that needs to be told about looking after a repeater, particularly at a remote location. This repeater was only 15 Kilometres away with easy access. If you have a story to tell about your favourite fault with a repeater please send it to me.

* 21 Waterloo Cr Lismurdie 6076,
VK5UU or VK5BES

ar

**Have you advised
DoTC of your new
address**

How's DX

Stephen Pall VK2PS *

Being a good DXer means being a good listener. This widely accepted advice comes in very handy when one chases a rare DX station, like Ghana 9G1AA.

Before one starts calling the DX station, one should listen carefully long enough to establish the following facts: Is the DX station is on the frequency, what callsign is it using and what is the QSL information? What is its "modus operandi"? Is it working transceive or split? If split, where is it listening? Up or down? Some listen down, especially on CW. Is the station calling in general terms or is it directing the call to specific areas, countries or continents? Is the station picking its contacts from the edge of the pile-up? If so, which edge? By following these simple rules the "novice" DXer will avoid acute embarrassment if he/she blunders on to the transmitting frequency. In addition to the above suggestions, please do not waste time and annoy everybody who is listening, by asking the DX station questions — as I heard recently — to confirm whether you are in the log for a QSO which you made 37 minutes ago?

Uganda could be on the air late April or early May.

Please forget giving your name and QTH, remember you are in a pile up! All you have to do is to give a report and identify yourself with your callsign and listen to the DX station for the acknowledgment of your report and your callsign. As a last advice: be courteous! Do not accuse your helpful fellow amateur who, 24 hours ago, gave you the vital information about a certain DX station appearing on a specific frequency, that he should move away, when the DX station was not on frequency, and your helper — whose name and callsign you have forgotten — is trying to organise a list for the orderly processing of the expected dogpile. Listening a little bit longer and establishing all the facts could prevent a very embarrassing situation for all of us.

GHANA — 9G1AA

Late in January several amateur members of the Dutch DAGOE Foundation were invited to operate from Ghana with the aim to raise funds for the provision of specialised medical facilities at Dormaa Hospital. Ghanaian authorities informed the group that such an activity would foster good relations between Ghana and National Radio Societies. Since then, DXers all around the world waited with crossed fingers, wondering whether there would be any activity at all, from this West African nation where amateur radio was banned more than a decade ago. The first news about a possible activity came in September last year. It was hinted that the ban on amateur radio activities would be lifted when the Ghanaian constitution reverted to civilian rule again, early in January 1993. After many

false reports, on 26 March 9G1AA has appeared on the bands and tens of thousands of DXers wanted to work the station. The third of April was a lucky day for amateurs in our region, when the Ghanaian station called to work only VK-ZL and Pacific area stations. QSL goes with donation to the humanitarian project, to PA2FAS Wim Faasen, Weeskinderendijk 81,3314 CM Dordrecht, Netherlands.

MELLISH REEF — VK8M

Bill VK4CRR advises that in mid September this year, a group of operators — Bill VK4CRR, Harry VK2BJL, Steve P29DX, Murray WA4DAN, and Ken V73C — is planning to be active from Mellish Reef, a tiny speck of a coral reef, which lies due East of Cairns at lat 17 degrees 25' S and 155 degrees 51' E at a distance of about 600 nautical miles. The only permanent place on the reef is a small sandy coral cay, called Heralds Beacon. This is the only part of the sand reef that remains above water. The little islet is approximately 150 feet wide by 800 feet in length, almost devoid of any vegetation and rises to a height of about 5 feet. The only inhabitants of Mellish Reef are the many thousands of seabirds and several species of nocturnal crabs.

Several DXpeditions visited the reef in the past. Harry VK2BJL is a veteran of the 1982 expedition. October 1984 saw the "Down Under DXers Contact Club" (What happened to them? Anybody know?), Jan VK2CIA, Les VK2WU, Tony VK3CE and Rob VK5ARO operating during the CQ WW Phone Contest as VK9MR. In January 1989, Jan VE3IEQ, Greg NM2L, Dave K9JI, Yugi JR1RCQ, Bruce ZF2KN, Joe VE3CPU and Victor KD2HE operated for nine days, achieving over 31,000 QSOs on all bands as VK9ZM. To my knowledge, there was no activity from Mellish between January 1989 and the proposed activity in September 1993. The VK4CRR group plans to have 5 complete HF stations and one 6 metre station on the air, 24 hours a day, on all bands including WARC, operating SSB, CW and RTTY. They plan to stay for 10 days and are still looking for three more operators. The estimated budget of the expedition is \$US 30,000 and donations are welcomed by Bill with cheques payable to the "1993 Mellish DXpedition" to the address: VK4CRR, Bill Horner, 26 Iron Street, Gympie Queensland 4570.

HOUTMAN ABROLHOS ISLANDS — VK6

At the time of writing this, it looks as if there will be some activity from these islands at the end of April or beginning of May. This limestone archipelago is about 400 km NNW of Perth, WA, and 60 km across the sea West from Geraldton, and it is the third most wanted island group (OC 71) in the world for those who are island chasers under the IOTA (Islands on the Air) award system. The islands are also known for the infamous "Batavia" mutiny in 1629 when 125 men, women and children were massacred

by the mutineers. The shelters built during this tragic episode still remain on the islands, which are now a wildlife reserve and landing is forbidden without prior Government permission.

Three West Australian amateurs, Bill VK6UE, Joe VK6BFI and Steve VK6VZ intend to operate from these islands for four days. They might use a special call sign and plan to be active on the 80 to 10 metre bands both on SSB and CW. QSL direct only via VK6ANC: North Corridor Radio Group, PO Box 244, North Beach WA 6061 with SAE, one "green stamp" or one IRC.

NAURU — C21

If everything goes according to plan, by the time you read this, the brief personal DXpedition of Atsu VK2BEX on Nauru Island will have finished. Atsu hoped to use the call sign C21/VK2BEX and be active on all bands in the CW, RTTY and SSB mode. The IC751, the Tokyo Hi-power HL1K, the R7 vertical antenna and dipoles are the equipment which he took with him. Direct QSL address is: Atsu Asahina, PO Box 195, Killara NSW 2071 Australia, by the usual reply envelope and return postage method. Period of operation: 12 April to 22 April.

LIBYA — 5A AND TUNISIA — 3V

Romeo 3W3RR has advised all the DX outlets that by the end of March or early in April he will be active from Libya 5A with a possible Tunisian 3V operation afterwards. He promises quick QSLing from his Bulgarian address: LZ3W3RR Romeo Stepanenko, Box 812, Sofia 1000, Bulgaria. He assures us that Box 812 is now under the direct supervision of the Sofia PTT office.

THE WANDERERS — HASBVS

The Hungarian Bus expedition is slowly proceeding through the United States to its final destination Hungary. After the shipping costs for the Australia-USA section were paid by a benevolent sponsor, the bus was allowed by the Customs to proceed with its crew from Los Angeles via Phoenix, Dallas and Tampa to Miami Florida. They left Miami on 16 April and arrived at the Dayton Convention on 22 April, where the bus was exhibited. From there they proceeded to Canada, visiting Toronto and Montreal. After two weeks in Canada, they will head South again via New York, Washington and will arrive at Jacksonville (FL), where the bus will be loaded on a ship departing for Bremenhaven, Germany on 5 June. The expected date of arrival in Budapest Hungary is 27 June.

FUTURE DX ACTIVITY

- XU7VK Sany was able to renew his licence, therefore he will be active until the end of June on 7-14-21-28 MHz bands SSB and CW. He is active mostly on weekends but can be heard sometimes during the week. QSL to HA0HW.
- Croat islands FT4WD appears regularly on the "14256" net around 1300 UTC. He was also heard on 14114 and 21152 around 1500 to 1600 UTC.

- Chris SP5EXA now has his own call sign in Qatar — A71CW. His direct QSL route is: Chris Dabrowski, Box 22101, Doha, Qatar.
- ZD9CQ is active on 14 MHz SSB from Gough Island in the South Atlantic. QSL to: PO Box 2934, Johannesburg 2000, Republic of South Africa.
- Marcel ON4QM expects to be active in May from Sao Tome & Principe.
- Sprally Islands. The much publicised DXpedition 9M0S did not take place in March. It is postponed to April or May this year. It appears that the proposed call sign might have caused some problems in certain quarters.
- Uganda could be on the air late April or early May, as the ban on amateur activity has been lifted by the Ugandan PTT 5X1XA James Searcher, N3JCL, 855 Springdale Dr, Exton, PA 19341 will operate mainly SSB and 5X1XB Paul Rubinfeld, WF5T, Box 4908, Santa Fe, NM 87502 will concentrate on CW.
- Frosty KSLBU is now in Sierra Leone for the next 2 years. He requested the call sign 9LICB.
- TN1AT can be heard on various DX nets between 1500 — 1900 UTC. QSL to F6FNU.
- There is a rumour that there will be a DX activity from Yemen at the beginning of October by a group of mainly Russian amateurs with some W, JY, and ZL participation.
- Attention IOTA island chasers. The Gove Amateur Radio Group VK9LC Mal, VK9CR Harry, VK9AZ Rick, VK9BD Bob and VK9TT Terry will be active from Truett Island from 22 to 24 May as VK9TT. Location: 136 degrees 50' E and 11 degrees 40' S Arafura Sea Coast, East Group. QSL direct to: PO Box VK9TT, Gove, NT 0881 or via the VK9 QSL Bureau.

- VP2VF — Dirk — 28 — SSB — 0011 — March. QSL to The Manager, PO Box 137, Roadtown, Tortola, British Virgin Islands, Caribbean.
- 9M6BZ — Armstrong — 14236 — SSB — 1139 — Feb. QSL to Armstrong, PO Box 10375, 88804 Kota Kinabalu, Sabah, East Malaysia.
- S0RA5D — Arseli — 7082 — SSB — 1801 — Feb. QSL to Arseli Echeguren, Barceci, Las Vegas 69,01479 Luyando, Alava, Spain.
- TA3D — Yasar — 14009 — CW — 0625 — Mar. QSL to The Manager, Box 963, Izmir, Turkey.
- H44MS — Bernhard — 18152 — SSB — 0847 — March. QSL to DL2GAC, Bernhard Stefan, Aach Str 25, D-7772 Uhldingen-Muehlenhofen 1, Germany.
- F5MBT — Saint Yves — 14120 — SSB — 0749 — March. QSL to The Manager, PO Box 199, CP 97257, Fort-de-France, Martinique, Caribbean.
- V31DE — Derek — 21205 — SSB — 0524 — March. QSL to The Manager, PO Box 168, Belmopan, Belize, Central America.
- VK9LM — Rudi — 10100 — CW — 0818 — March. QSL to DJ5CQ, Rudi Muller After Main 23, D-8601 Ebing/Bamberg, Germany.
- N9NS/KH5K — Mike — 7015 — CW — 1207 — March. QSL to N9NS Michael C Goode, 10340 Broadway, Indianapolis, IN 46280, USA.
- 9A2WV — 14 — SSB — 0744 — March. QSL to The Manager, PO Box 312, Rijeka 51000 — Republic of Croatia.
- 4N5ET — Tod — 14006 — CW — 0609 — March. QSL to The Manager, PO Box 44, Kocani, Republic of Macedonia, via Bulgaria.
- C49C — 14253 — SSB — 0633 — March. QSL to The Manager, PO Box 4574, Nicosia, Republic of Cyprus.

INTERESTING QSOs AND QSL INFORMATION

- LY75BA — Gedas — 21 — SSB — 1037 — Feb. QSL to The Manager, PO Box 34, Birza, 5260, Lithuania.

**Have you
advised the WIA
Federal Office
of your new
call sign? Use
the form on the
reverse of the
Amateur Radio
address
flysheet.**

FROM HERE AND THERE AND EVERYWHERE

- Murphy's Corner. The gremlins hiding in typewriters, word processors, and printers do cause problems from time to time. Not so long ago Dan FC1SVE wrote to us, pointing out that the date of the death of Napoleon was not in 1815 — when he was transported to Saint Helena — but in 1821 some six years later, when he finally passed away in exile (see page 43, Jan 93 AR). Thank you Daniel for the correction. It is good to see that "Amateur Radio" is read on many continents and in many countries. Closer to home, Les VK4DA points out that the QSL manager of VR6BB is not JH2KOZ (AR March 93) but JF2KOZ. Apologies a la around.
- Ken Matchett VK3TL, the Honorary Curator of the WIA QSL Collection, advises me that it is now one of the largest collections in the world, made up of some 400,000 cards.
- Rolf DL6ZFZ Rolf Rahne, PO Box 15, D-3304 Gommern, Germany advises that he is QSL manager for the following stations from the CIS countries. 4K2CC — 4K2UV3CC — UV3CCUA1P — 4K2OKV — UF6FKW — UL7ACI — xx/UL7ACI — RL7AA — RA6WF — RE92C — UHFRW — 4K4BG — 4K4BEM — 4K4BEU — 4L1FKW — ULOA — ULOACI — ULOOE — RM8MW and UM8MY.

- Neil VK6NE (VK9 — VK0 WIA Bureau Manager) wonders whether other QSL Bureaus are receiving or sending QSLs to the Peoples Republic of China QSL Bureau? He personally has never received any cards yet from "BY" land via the bureau. Neil also says in his letter to me, that he is yet to receive a complete list of the VK0 operators. Those listed in callbooks are hopelessly wrong. QSL bureaus feel the financial crisis everywhere. Neil says he received a 2 kg parcel from LU land for all VK call areas. If any VK is waiting on a QSL card from LU via the Bureau — and the cards go back to 1989 — their Bureau soon will have them.
- In the middle of March King Hussein of Jordan (JY1) appeared on the Buttery DX net, 142265 until around 2230 UTC.
- The Mozambique Government has changed the callsign structure. New prefixes have been assigned from C91 to C96, the prefixes C97 to C99 are reserved for VHF and special event stations. C9RJ is now C9JL, and C9RDM is C9J5. The QSL manager for both stations is W8GIO.
- DPOGVN is a German Antarctic station and can be worked easily from VK. QSL goes to DL1JCW Siggi Gredfel, Box 21, D-9250, Miltweida, Germany.
- Not all the Somali operations are acceptable for DXCC. According to Bill K5FUV, the operators need proof of the location, and a permission to operate from the person in charge of the area. The person in charge could be an UN or US commander or a local Somali official who might still carry on with the administrative duties despite the non existence of a national government.
- The Southern Cross DX net moved again, back to the old frequency on 142265 at 1100 UTC.
- The operations from Kingman Reef N9NS/KH5K started on 11 March and closed five days later. Palmyra N0FW/KH5 started up a day or so later after Kingman Reef but closed on 16 March due to personal injury to one of the participants and heavy rain damage to the equipment. The Kingman Reef activity produced 23500 QSOs, and the Palmyra activity in three-and-a-half days with only two operators netted about 10000 QSOs.
- Navassa Island in the Caribbean was a hive of activity for a short period between 26 March and 3 April. A large multi-national group of nine operators was active on all bands on CW, SSB, and RTTY. The callsign used was W5JJK/KP1. QSL goes to Vance Le Pierre, 2618 McGregor Blvd, Fernandina Beach, FL 32034 USA. It appears that when operating in the CW mode the callsign used was N6S/KP1.
- The French administration has changed the prefixes of its overseas dependencies. The French overseas departments French Guiana (FY), Guadeloupe (FG), and Martinique (FM) will use the TO prefix. The French overseas territories FO, FR, FT, FR, FW, FK will use the TX prefix.
- Antoine Baldeck F6FNU who is or was QSL manager for many hundreds of DX stations, requires US\$2 and an SAE for the return of the DX card.

- The 1993 HCBA operation can be confirmed by Betsy Townsend W7V7, PO Box 644, Spokane WA 99210 USA.
- According to the DX News Sheet, Norwegian Telecom has issued an authority to Yuii Zaruba UA00BA to use the callsign 3Y/ROD on Bouvet Island during 1993. The Norwegian Dept of Environment has also issued a landing permission on Bouvet. The operation is proposed for April/May. However, the weather which is usually very bad at this time of the year in Antarctic waters, may prevent any activity.
- The special Canadian prefixes XK, XQ, XN, are celebrating 300 years of postal communication.
- Gerard will be active from Angola as D2BG for a period ending 1 August 1993. Christian ex-TB8A and ex-TB8A arrived in Angola to begin a two year tour of duty. He could be active as D2SA or as D2BSA. F6FNU is the QSL manager for both stations.
- Werner DK8KE who for many years conducted a net on the novice band around 21170 kHz, has become a silent key.

- In Tonga A35, the 18 MHz band can now be used by amateurs.

QSLs Received

Direct from managers or operators: HS0ZAD (4W op), V63OM (4W op), A35KB (4W op), 4S0UK (8W Mgr G8PDW), XU7VK (3W Mgr HA0HW), ZA1M (2M op via HB9BGN).

Thankyou

Thanks to all of you who have kept me informed and assisted me in compiling these notes, especially to VK2BEX, VK2DOJ, VK2GS, VK2KFU, VK2LEE, VK3TL, VK3CRR, VK4DA, VK4OH, VK4UA, VK5IE, VK6NE, VK6RO, VK6VZ, VK8LC, FC1SVE, HA5BUS, HA5HO, HA0HW, and the following publications, QRZ DX, The DX Bulletin, and the DX News Sheet.

Good DX and 73

* PO Box 93, Dural NSW 2158

af

Education Notes

Brenda M Edmonds VK3KT *

I have recently taken a fresh look at the Regulations question bank, to identify questions which will become obsolete when the revised Regulations brochure is released (Currently, it is expected that this will happen in July).

In the hope of being able to extend the bank, I went back to the sample examination papers which were prepared in the early 1980s. I was surprised at the number of questions which were no longer relevant, even to the current regulations. Questions are no longer asked about the local Authority which must give permission for a tower to be erected, or how to have a lost Certificate of Proficiency replaced, or EPIRBs or how to apply for a station licence. However, we do now have the possibility of questions on linked repeaters, operation of unattended stations and packet modes.

As the Amateur Service has become deregulated, less emphasis has been placed on the "Big Brother" side of DoTC, and it has become accepted that the amateurs, mostly, are prepared to live within a reasonable set of rules. Self-regulation has always been the aim. It is just that the framework was spelt out in more detail previously.

One problem arising from this latest deregulation will be the need for more examination questions, based on a reduced set of regulations, to be produced for the bank. If any readers have produced, or are able to produce, new questions, I would be very pleased to receive them for addition to the bank.

There have been a couple of suggestions to overcome the shortage of examinable regulations material. I would be pleased to receive comments from readers. Firstly, is a regulations examination really necessary now that so much deregulation has occurred? Secondly, why not put questions on operating

practices (ie, traditional, not those laid down by DoTC) into the regulations examinations, or even add some sort of practical test? It is interesting to note that the new Novice licence issued in Britain requires attendance at a course of instruction, including completion of some practical activities, before a licence is issued.

Whilst on the topic of regulations, the continuing low pass rate for the regulations examination is surprising. It seems apparent that candidates are not giving sufficient attention to this section, or perhaps instructors are giving too little help. I know from experience that it is hard to teach the regulations, but the questions are nearly all straightforward memory tests, and there should be no excuse for a candidate not being prepared when attempting this examination.

Revision and extension of the Theory question banks is proceeding slowly. As usual, member input is welcome. In particular, any new questions on "Other modes" such as packet or digital modes would be appreciated. My thanks go to those who have already notified me of existing questions which need to be reworded or modified.

* WIA Federal Education Co-ordinator
PO Box 445, Blackburn, VIC, 3130

BC

Help stamp out stolen equipment — always include the serial number of your equipment in your Hamad

AMSAT Australia

Bill Magnusson VK3JT *

Satellite Frequencies

I was very pleased to receive a letter recently from Derek Mitchell VK7KKK high-lighting a wrongful inclusion in the OSCAR frequency list published in the March column. As was pointed out in the "current summary" in the January issue, UoSat OSCAR-14 has been removed from amateur radio service and is now being used by the SateLife organisation. I was sorry to hear of the error of course but pleased that, (a) some-one noticed it and (b) took the trouble to notify me. Thanks Derek. OSCAR-14 should not have been included in the list as it is no longer available for amateur use. All traffic previously carried by OSCAR-14 is now carried by OSCAR-22. OSCAR-14's future as an amateur radio satellite is unknown at this stage and as Derek pointed out it's wiser not to include it in the OSCAR list so as to prevent the possibility of amateurs fruitlessly trying to uplink to it or listen for its down-link signals. I did ask at the time for feedback and I repeat that request now. I intend to up-date that list and summary every six months or so. If any other readers notice an error, omission or anomaly please notify me ASAP, as there is a lead time involved in the preparation of material for the column. I'm already compiling the next list which should appear in a couple of months time.

Odd Spot

We're all familiar with ACRONYMs. Amateur radio examples like SAREX, AMSAT, OSCAR etc come to mind readily. No-one loves them more than NASA. Its own name is an acronym. This classic example was included in a recent bulletin outlining the various experiments on board one of the space shuttle missions.

HERCULES [Hand-held, Earth-oriented, Realtime, Co-operative, User-friendly, Location-targeting and Environmental System].

Even NASA recognises this as something of a record by going on to say, "This is the farthest we've seen anyone go for an acronym in the Space Program". And what is this device? IT'S A CAMERA! The description goes on, "This experiment takes a Nikon electronic camera, attaches gyroscopes, sensors, and a computer interface, and links it to a lap-top computer. When a photo is taken, it calculates the latitude and longitude of the site on the ground that was photographed, and records it on magnetic disk with the image".

MIR-STS QSO

The long awaited space to space QSO between MIR and the Space Shuttle has finally become a reality at just before 2325 UTC 10 APRIL 1993 off the coast of Chile.

At the time the two spacecraft were located approximately:

MIR Lat -51 deg. Lon -92 deg. Alt 394 km
1455 km W of Punta Arenas Chile.

STS56 Lat -64 deg. Lon -88 deg. Alt 290 km
1185 km W of Punta Arenas Chile.

With 100 kilometres of altitude between the spacecraft, no visual sighting was possible. But the ice has been broken, a QSO in space via amateur radio!

SOURCE: Amsat Australia net, Graham VK5AGR. . 11 April 1993.

National co-ordinator

Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

Amsat Australia net:

Control station VK5AGR

Bulletin normally commences at 1000z, or 0900z on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies: (again depending on propagation conditions)

Primary 7.064 MHz. (Usually during summer).

Secondary 3.685 MHz. (Usually during winter).

Frequencies +/- 6 kHz for QRM.

Amsat Australia newsletter and software available

The newsletter is published monthly by

Graham VK5AGR. Subscription is \$25 for Australia, \$30 for New Zealand and \$35 for other countries by AIR MAIL. It is payable to AMSAT Aust addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Manned Space Vehicle QSOs

One could not help being impressed by the current flurry of activity on the amateur bands from manned space vehicles and the promise of more to come. It may be timely to just go through some of the basics of working this kind of satellite "DX".

MIR

Voice QSOs are rare but be ready for them. Have the audio turned up when trying to work R2MIR-1 on packet. They have even been heard to call CQ. When working packet turn your retries down to 5 or so. If you don't get through after that you probably won't after 15. Listen for their packets before calling. Have the connect test already typed into your type-ahead buffer. Watch for a disconnect frame indicating a connect opportunity. Be ready to "hit the button". They have DIGI turned on so even if you get a BUSY reply you can call another station using R2MIR as a digipeater in the sky. Keep your keps right up to date. Make sure your computer clock is accurate. If you have an

inaccurate clock, a program like "CLOCKWORK" will help to keep it within a second or so. If you can't track, then use an "all-sky" antenna like a SLIM JIM or TURNSTILE. You don't need much power. I have worked them many times on a hand-held transceiver. Go for lower rather than higher passes. Even the best auto-track system will be hard pressed to keep up with MIR on an over-head pass. It just moves too quickly.

Shuttle

Unlike MIR, SAREX never uses simplex mode. There is always plenty of information on the packet network before and during a SAREX mission (Sometimes ad nauseam). Make a note of the frequencies and stick to them. The packet robot is easy to work and usually results in a few seconds of QSO, a QSO number followed by a disconnect. Average of 5 to 6 seconds per contact. Once you've made it don't keep trying, let others have a go. I'm often asked how to get your feet wet on amateur radio satellites. Trying for MIR and STS contacts is the best bet for a new-comer to sample some success without much outlay for equipment. Just about every ham shack will have some VHF FM gear and an omni-directional antenna. The number of digital mode TNCs being sold would indicate that most shacks also have a computer these days. GOOD LUCK.

* 359 Williamstown Road, Yarraville VIC 3013

Packet: VK3JT@VK3BBS

WICEN

News from WICEN (NSW) Inc

The Annual Co-ordinators Conference is on the weekend of 15-16 May, at the Police Academy in Goulburn (same place as last year). All WICEN personnel (not just co-ordinators) are invited, for a fee of \$55-00 per night; this covers all accommodation and food. Please contact Morton VK2DEX for further details. On the same weekend is a car rally in the central coast area. And Dave VK2UDT is looking for volunteers.

A Disaster Management Course is on the weekend of 22-23 May, and Barry VK2AAB is accepting applications from those personnel interested in attending. These courses are worthwhile as they give a good insight into what happens "behind the scenes" during disaster handling.

All WICEN personnel are reminded that the only postal contact with WICEN (NSW) Inc is PO Box 123, St Leonards 2055, all other addresses are null and void.

WICEN (NSW) conducts nets at various times, the most prominent are the Sydney VHF Net every Thursday night at 2130 (local) on repeater 7150 in Chatswood, and a state-wide HF net every Tuesday night on 3.615 MHz at 2030, although this net appears to be defunct.

Dave Horsfall VK2KFO
Publicity Officer
WICEN (NSW) Inc

Divisional Notes

Forward Bias — News from the ACT Division

by Chris Davis VK1DO

Members in the ACT have participated in a survey of what and when members would like in terms of broadcasts, meeting topics, the role of publicising our hobby and, indeed, the value of the division maintaining our office which is located next to our regular meeting room at the Griffin Centre. Preliminary indications are that the office is considered of value. We are most likely to upgrade the role and importance of this central facility. An overwhelming number of members favour our weekly broadcast moving to a Monday evening instead of its present Sunday time slot. Within the survey we suggested that Monday would become a primary broadcast time with perhaps a local FM rebroadcast on the following Sunday. Many people took the trouble to endorse Monday as a more ideal primary time, but added that a later weekday evening would be preferable for repeats.

It is our aim in the ACT to devolve and share the role of broadcasts around the members of the division, and encourage each member to be active in the preparation, reading or engineering of our local broadcasts. Changes and enhancement to the control circuitry at Mt Ginini will facilitate a single input signal being radiated on both two metres and 70cm. This will greatly simplify the engineering difficulty of originating a divisional broadcast.

Incidentally, the Mt Ginini 2m voice repeater was struck by, or closely glanced by, lightning on Saturday 20 March, resulting in negligible transmitter power. Paul VK1BX and Rob VK1KRM attended our Monday 22 March committee meeting indicating their intention to travel to the site that night. The equipment on site was retrieved in total and returned to the comfort of a local operating theatre. The gear was restored to the site on Tuesday 6 April sounding better than ever. Our respect and great appreciation are extended to Paul and Rob for their professional efforts and promptness for what is a labour of love.

The technical topic for our May general meeting on 24 May will take the form of a presentation on feedline losses with actual demonstrations of the effects of losses in different cables and on different amateur frequencies. We look forward to seeing you at our May meeting.

73 de VK1DO

VK2 Notes

Tim Mills VK2ZTM

Country Field Days

The Oxley Region ARC will be holding its two-day event over the June long weekend at a new venue this year, the Wauchope Showground. In August, Wagga ARC will hold the second Riverina event in its region.

QSL Bureau Changes

Changes were recently introduced in the distribution of INWARDS cards from the VK2 Bureau. These have been detailed in VK2WI

broadcasts, the annual report and in some club newsletters, as well as information included with card delivery. A free membership service posted to the address on file for the member. Non-WIA members can have the Bureau service for \$36 per annum. The Bureau needs to know your wishes re handling, and you must keep the address and callsign details up to date. Outwards cards only via The Bureau, Box 73, Teralba; all other matters to QSL Manager, c/- PO Box 1066, Parramatta 2124.

New Members

The following joined the NSW Division recently, and our usual warm welcome is extended to them.

AS	Allord	VK2ASZ	Singleton
D (David)	Barry	Assoc	Springwood
R (Richard)	Benfallo	VK2CRB	Engadine
A (Sandy)	Bruce-Smith	VK2AD	Pyrmble
DL (Ron)	Cooka	VK2MMR	Round Corner
BM (Barry)	Crocker	VK2DBA	Crookwell
N (Nigel)	Cupitt	VK2KJU	Seven Hills
HE (Harry)	Dyer	VK2TBO	Woolgoolgon
G (Gordon)	Faulkner	VK2TAC	Mayfield
LT (Luke)	Gow	VK2GXQ	Taree
A (Alec)	Havassy	VK2AZO	Woolrich
MJ (Marjorie)	Jackson	VK2AAJ	Narrabeen
P (Peter)	Jeremy	VK2FJ	Alexandria
BJ (Bradley)	Latta	Assoc	Wollstonecraft
GA	McGillivray	Assoc	Coffs Harbour
AS (Adrian)	Mueller	VK2MEC	Vaucluse
DJ (David)	Nurse	Assoc	Auburn
S (Sam)	Reese-Field	VK2FPJ	Broadway
DAJ (David)	Shaw	VK2TIP	Kogarah
JS (John)	Telek	VK2XTB	Punchbowl
AW (Allan)	Thompson	VK2GXK	West Ryde
PA (Paul)	Thompson	VK2TPP	Narrabri
ML (Michael)	Warner	Assoc	Guildford
RR (Robert)	White	Assoc	Alford Point
D (Dennis)	Williams	VK2DXW	Mayfield

VK3 Notes

Barry Wilton VK3XV

Repeaters — VTAC Technical Note

If you are home brewing or modifying a commercial transceiver for use with a WIA Victoria licensed VHF or UHF FM voice repeater, the transmitter deviation should be adjusted to 4.7 kHz. Some amateurs have been setting deviation to 3.5 kHz as recommended in most commercial specifications. A deviation of 3.5 kHz will not provide an optimum result if the transmitter is used in conjunction with a repeater.

Sunday Broadcast

After a long period of dedicated service, Bill Trigg VK3JTW has relinquished the reins as Broadcast Co-ordinator owing to increased commitments to his employer. Bill will remain on the Victorian Division Council and continue to provide assistance when possible to his successor.

Thanks Bill for the dedicated service over a long period of time.

George Hunt VK3ZNE has been appointed to replace Bill.

Members are reminded that all advertisements of "items of equipment for sale" should be forwarded in writing to the

Division office. Copy deadline is on the Tuesday preceding the broadcast.

News and other items of general interest are always most welcome.

New Membership Certificate

Design of a new membership certificate has been finalised. Printing will be completed this month, and new members who join the Victorian Division after May will be recipients.

Telephone RF Interference

Recent publicity regarding RF interference to Telecom's Touchtone 200 series telephones indicates there may be inconsistency in the manner in which the problem has been addressed by regional Telecom staff. There also appear to be differences in application of policy in different states.

WIA Victoria has been negotiating with Telecom at senior management level for many months, and has received both assistance and co-operation in rectifying interference problems experienced by members.

If you are having trouble with TF200 interference, it would be advisable to contact the Division office.

New Recruitment Brochure

Artwork and copy is now being finalised for the production of a much needed recruitment brochure containing information about WIA Victoria and its benefits and services.

Printing should be completed and the brochure available for distribution in June.

Book Sales

Members may have noticed an increase in the price of books published in AR Magazine every month.

The published price is now the "list price" and members of the Division will receive a 10% discount.

WIA Victoria carries most of the books advertised, however a few of the less popular are not in stock.

QSL Bureau

An audit of the QSL Bureau data base has recently been completed, and a number of callsigns deleted as the licensees are not currently financial members.

Cards for these persons will be retained for six months.

If you change or upgrade your callsign it is necessary to notify the bureau, in addition to the membership secretary or the Federal office. The bureau service is free of charge to members.

MEL03 CB Repeater

Several years ago the Victorian Division Council agreed to sponsor the licence for the Melbourne CB repeater MEL03 as a public relations gesture of goodwill.

This arrangement has now been terminated and the licence transferred to the Omega Radio Club.

5/8 Wave

Rowland Bruce VK5OU

I have just finished talking, (by telephone), to the President of the Division, Bob Allan VK5BJA. He was busy putting together his annual report to present to the AGM on 27th April. I don't want to pre-empt the full text which will appear next month in the Journal, and in any case, those who attended the meeting will know the contents already, but it sounded as

though he was having the same problem I encounter when I sit down to write this column. What is there to say that is important enough to live for posterity, and how does one avoid sounding like the Oscar presentations? "I would like to thank so-and-so, and thummmmy-jig, and what's-his-name and...!" Gilbert's "little list" seems all too close for comfort. Nevertheless, there are always people to thank, sometimes unseen and unheard by the majority. Sometimes they get recognition, others sometimes may feel they do not. I can almost read your thoughts by now. "Get on with it then. Who are you going to thank this time?" I'm not!

Bob said a very telling thing. What he could put in his report was a heartfelt, "Well, we survived!" We have survived at a time when many things around us have not. Life has not been easy for many people in South Australia over the last year or so, yet again last month we went against the national trend towards recovery, and experienced another rise in unemployment. Nor has it been an easy time for the Institute. And now I am beginning to hear the same talk when I visit the Territory. Even the casino in Darwin has shed staff, Territorians are having to tighten the belt it seems.

In the midst of this we have survived. Amateur radio tends to be a fairly expensive hobby nowadays, at least to set up. The days of building a single band ten watt CW transmitter, and feeding a dipole or G5RV as the initial venture onto the bands has probably gone for good, yet once we are under way, the costs involved can be minimal. When I get myself on air again, (yes I know, I've been threatening it for two years now) then it will be with my 1976 TS520S, a tower and antenna recycled from my previous address. Maybe in six or eleven years' time I'll do a final upgrade with some of my retirement package, but I'm sure, if necessary, I could manage to enjoy the hobby with my present equipment until all my earthly communication needs ceased. A bit of electricity and midnight oil to pay for, some QSL cards maybe, and, I hope, the ability to pay my membership of the WIA and I shall be happy. What an ideal hobby we have to be able to enjoy it in a situation such as retirement at so little cost. Old Amateurs ought never to die. There is always somebody to talk to a few kHz away! The other time the cheapness of the established hobby is useful is during periods of enforced idleness, following a spell in hospital for example. And during nine months of being unable to find work, it was amateur radio which kept me sane during the day, and gave me something to do during the long nights of sleepless worry (How else do you think I managed to put on such a spurt in the DXCC listings in 1980-81?)

So we are back to the beginning. Many amateurs are finding it tough. Some have had to relinquish their WIA membership. It may not be much at about \$140 a week, but if it comes on top of other misfortune then the subscription may have to be the first thing to go. Through all this though, there are people to talk to, to reminisce with, to philosophise with, or just to bore. These are the people who ought to be thanked for their involvement in radio. What a marvellous hobby we have indeed.

ar

VHF/UHF An Expanding World

Eric Jamieson VKSLP *

Six metres

Last month I reported **Andrew VK8AH** had worked **XU5DX** and **XU0UN** in Cambodia on 25Z. However, it appears **Steve VK6PA** worked **XU5DX** on 1/1/93 so that would have to be a first for VK. Also, **XU5DX** was worked by **P29CW**, and by **Ron VK4BRG** and **John VK4TL** on 5/3 at 0621 on CW, which no doubt pleased both operators. I also understand the Cambodian stations were worked by **VK8RH** and **VK8ZMA**, so the signals were shared around northern Australia.

Pitcairn Island

John VK4TL also advises that on 13/3 at 0615 he worked **VR6JJ** on Pitcairn Island which appears to be a first from VK on six metres. I had received a report some days earlier that **John** and **Ron** had heard what they thought was **VR6JJ** but the signal was too weak to correctly identify. Has anyone else worked **VR6JJ**? QSL route for **VR6JJ** and **VR6BB** is **JF2KJZ**.

So once again the equinox has provided some rare signals and this indicates that six metres is not dead — hence the age-old adage that *six metres never really closes down, it's only the operators who do!*

*Seems strange
to read about
so much QRM
via the moon.*

Published in the Japanese *CQ Ham Radio* magazine for March 1993 (copy by courtesy **Graham VK6RO**) is a picture of the late **Bob VK4NG** sitting in his Rockhampton shack in 1956 about the time **JA1AHS** established the first JA overseas QSO when he worked **Bob**. I immediately noted the two AR7 receivers amongst the other equipment, one complete in its rack and the other sitting on the bench with the large coil boxes placed on top. With this observation I went into "nostalgia mode" as at one time I owned three of these receivers and to this day regret that I did not keep one! It appears the contact was made on 50 700 MHz which is well up the band but there were probably good reasons for the choice of frequency, but we may never know as **Bob** is now a Silent Key.

From the same source I note that **JA9TLD** worked **SM6HF** in Eastern Malaysia on 1/1/93 at 1035 on CW and 1050 on SSB, and at 1635 worked **XU5DX** in Cambodia. **XU0UN** was worked on 1/1/93 by **JA2VFH** and others and the Pitcairn Island station **VR6JJ** was noted on 50.120 at 1130 on 29/1/93. QSL route for **XU5DX** is **F6FNU** and **XU0UN** is **VK3OT**.

News from Europe

Geoff G4JCD reports that **Andorra** will come on 50 MHz with **C31HK** indicating interest but has no equipment. It took five years of negotiations with the PTT to receive a five year permit, the difficulty being exacerbated by previous amateurs operating outside their licence conditions. As a result, only residents can operate on the VHF/UHF bands and no more expeditions will be permitted.

Ted Collins G4UPS reports those awaiting a QSL from **7Q7JA** should not despair as he has just received his card for an October 1990 contact. QSL route is via his home callsign **1J1HE** — **Yoshitaka "John" Kawaku**, 2-10 Yamate, Saitama 357, Japan. Also QSLs for **Bob K8Z2R** can only be received via **Andy K8EFS**.

UK six metre contacts during February seem to be limited to **D, F, LA, OE, OH, OZ, S55, SM, SP9A2** and **9H**. You notice I said "limited to" but their tally is at least eleven countries! Also mention was made of the contact between **DK5UG** and **VK4FP** on 21/2 at 0840.

Ted also sends a list of the 150 countries/prefixes worked by **UK amateurs** to 17 January 1993. As I will be soon running a similar list for VK, you may eventually like to compare the differences. To save space they are not in column form but are listed alphabetically to assist you. They are: **1A0, 3DA, 3K, 4J1, 4U1, 4X, 5B4, 5H, 5N, 5V, 6W, 6Y5, 7P8, 7Q, 7X, 8P6, 8R1, 9A, 9H, 9J2, 9K2, 9L, 9Q, 9X, 9Y, A2, CE, CN, CO, CT, C73, CU, CX, C3, C5, C8, LD, DU, D4, D6, EA, EAB, EA8, EA9, EI, EL, ES, F, FM, FR, FR5, FR7, FY, G, GD, GI, GJ, GM, GU, GW, HB9, HB0, HC, HC8, HH, HI, HK, HR, HR, HV, HZ, I, IS, JA, J37, JS, KG4, KG6, KP2, KP4, LA, LU, LX, LY, LZ, OA, OD, OE, OH, OH0, OH0M, OK, OK12, OM, ON, OX, OY, OZ, PA, P7, P8, PY, PY0, PZ, P4, SM, SP, SV, S0, S5, TA, TF, TI, TK, TL, TR, TU, TV, UX1, UL7, U22, VE, VK, VP2E, VP2M, VP2V, VP5, VP9, V86, V2, V3, V4, V5, W, XX9, YL, YN, YO, YU, YV, YV0, ZA, ZB, ZC4, ZDB, ZF, ZP, ZS, ZS9, Z2**. From the above you can see the UK fared rather well. The main ones missing are those from the Pacific area which are available to us, e.g. **3D2, 5W1, A35, FK, FO, H44, KC8**, the full KH and T3 series, **V85, VK9, YJ, ZK** and others. Interesting omissions are **KH6, P29, XE** and **ZL**.

50 MHz DXCC Honour Roll

The following is the latest tally of operators callsigns who have worked 100 (DXCC) countries or more on six metres. There are 106 callsigns representing four continents, the absentees being Australia and Africa, both of whom may have to await the next cycle, but then, with the unpredictability of six metres, you never know! However, for everyone, the upwards climb will now be very slow. Many stations are waiting in the 80s and 90s including VKs. Some overseas stations need to brush-up on their QSLing, one in particular I note has worked 99 countries and confirmed 65!

152 JA4MBM
130 PY5CC
125 VE1YX
124 G3WOS
123 JA1RJJ
120 JA6RJK
119 W2CAP/1, W5FF, WA1OUB
118 K5FF, PA0ERA
117 K5CM
116 JA1BK, W4CKD/B
115 K1TOL, K8WKZ
114 N5KW
113 JA1GTF, JE1BMJ
112 G0JHC, JA1VOK
110 JA3EGE, W3XO/S
109 K2QIE, W2IDZ, W3WFM
108 CX8BE, G4JCC, WB2WSY, W3JO, WW8M
106 JR6WPT PA2VST, W5VY
105 G4UPS, HC1B1, OH2BC, WA6BYA
104 9H1CG, G3JVL, G3ZYY, G10TC
103 G4AHN, JA1PVI, JA6TEW, K1GPJ, KH6IAA, N16E/KH6, PA0HIP, W4OO
102 G4JICD, JF2KOZ, JR6WXY, K3QMX, K4CKS, LU3EX, W3IWU, WZ8D
101 G4CCZ, JA9SSB, J1DLZ, J2CCF, JR2AJS, JR2AUE, JR3HED, JR6HI, KP2A, PA3BFM, SV1DH, W1JR, WB2MAI
100 G3JVL, G3RFS, G3ZYY, G4IGO, JA1BK, JA1GTF, JA2BZY, JA2DDN, JA6RJK, JE2IH, JE2KCP, JE2KDN, JH2HCB, JH2NZM, JH2TQH, JH2TOM, J2CCF, J3WXX, JK1PEC, JR2HCB, JR2HOG, JR3DVL, K1JRW, K2MUB, K6QXY, K8EFS, KA1PE, LU3DCA, LU8MBL, PA0VST, W5EU, WA2BPE, WB2CZB, WB4OSN, WB8VYF

Acknowledgements to QST December 1992,
JA1VOK, January 1993 Five Nine, CQ, Ham
Radio and VK3OT

Microwave news

Wai VK6KZ has sent me details of an inaugural 10 GHz record claim for Western Australia. This took place on 28/2/1993 at 0128 over a distance of 85 km, with reports 5x87 for a contact of 30 minutes.

Ross VK6KAT accompanied by Bob VK6KRC was the other end of the contact, and they operated from the roadside between Roelands and Collie at a height of approximately 220 metres AHD. VK6KZ operated portable near Cape Naturaliste Lighthouse at a height of approximately 120 metres AHD.

Both stations used similar equipment, namely ex-military Tellurometers Model MRA301 using an Eimac klystron Type EM1070 providing 30 milliwatts and tunable between 10.050 and 10.450 GHz. The antenna was a 317 mm diameter parabolic dish with stat gain of 27 dB above an isotropic radiator. Modulation was FM phone.

With such high gain antennas, pointing accuracy was critical. Ross examined the site in daylight and then in darkness took a bearing on the flashes from the lighthouse. Wai initially used a compass bearing which when combined with the accuracy of Ross's signal allowed the two dishes to be correctly aligned.

The above contact follows other contacts over 50 km by stations such as VK6ZSB/p and VK6KH/p, by VK6KZ/p and VK6KRC/p and a 71 km contact between VK6KRC/p and VK6ZF/p in the December/January period. Good work!

While talking about 10 GHz, VK5KK, VK5NY and others are almost ready to commence serious work using narrow-band techniques and will be seeking to establish contact over several hundred kilometres, so watch out Wai! On the subject of 10 GHz, I note in the 1/1993

issue of Dubus magazine (courtesy Doug VK3UM) that European amateurs exhibit a keen interest in that band, with 31 entries in their top listing, the greatest distance of 1043 km attributed to SM6ESG and the shortest 300 km to DB4CEP/p. Nineteen of the claims are for distances in excess of 500 km, with ten in excess of 800 km. VK5 will need to bridge that magic gap of 1800+ km between Adelaide and Albany to really put a dent in the European effort.

From The World Above 50 MHz by Emil W3EP, the North American distance record for 10 GHz is a tropo contact over a distance of 957 km on 10/9/88 between NN6W and N6QX. The 24 GHz record was extended to 256 km on 12/9/92 by K6STG/6 and WB7ABP/6, using 10 mW CW rigs and 60 cm dish antennas. Liaison was on 144 MHz.

On 47 GHz the present American record of 105 km of 6/8/88 by 7KAUO/7 and WA3RMY/7 has been broken by a 166 km contact on 15/9/92 between HB9MIN and HB9MIO. According to Emil W3EP, the Swiss pair used similar home-brew transverters with 144 MHz IFs and transmit what they call constant amplitude single-sideband modulation (CASAM). These signals can be amplified with minimal distortion by Class C amplifiers, yet are compatible with SSB receivers. Transmit power was 8 mW with 60 cm dishes providing 45 dB gain, receiver noise figures were about 10 dB. Signal reports were S2-3 each way and antenna sighting was done using 24 GHz gear running less than 1 mW of power!

EME Report

This is a difficult segment to keep alive as so little information comes to hand. However, Geoff G4JICD reports Charlie G3WDG has completed two QSOs via the moon on 10 GHz,

the initial QSO with WA7CJO and the second with SM4DHN. It would be interesting to hear more about those contacts.

Doug VK3UM sends news of his 1993 EME activities using 432 MHz 9/1, 1910 UTC UT5DL, 1917 EA2LU, 1925 G4RGK, 1928 HB8SV, 1936 JA6CZD, 1953 OK1KIR, 10/1 1200 W2PGC on CW and SSB, 1248 N2IQJ.

6/2 1100 W2CRS, 1141 9M2BV, 1730 UA4API, 1118 DF3RU, 1816 DL3BWW, 1832 SM2CEW, 1845 IK1MTZ — so many calling that Doug lost the moon in the process! 7/2 1816 RA3YCR, 1828 DL3BWW, 1844 UT5DL, 1851 RB5EC, 1858 15TDJ, 1905 DL9NDD, 1908 RB5PA, 1920 RB5LGH, 1923 OH2PO, 1954 ON2OF, 2002 15CTE, SP5CJT, then a mass of signals, the QRM causing him to lose the moon, again! Seems strange to read about so much QRM via the moon, this tends to indicate there must be many stations now capable of being heard by the better equipped stations — I suppose this is the penalty one pays for continuing system improvement, including much better receiving capability.

5/3: 1600 EA3UM 6/3: 1930 W8TN. Current initials 178, countries 34.

Closure

So far the equinox has been lean on DX stations and lean on news, but now April has arrived results may improve. I look forward to receiving some news from those who operated in the John Moyle Field Day on 20/21 March.

Closing with two thoughts for the month: 1. If there's one thing that makes a husband angrier than his wife refusing to tell him where the money went, it's her telling him, and 2. Everyone eventually stops smoking. Mother Nature — the most permissive of parents — sees to that. Those who smoke heaviest stop earliest.

73 from The Voice by the Lake

* PO Box 169 Menangle SA 5294 All times are UTC

QSLs WIA QSL Collection

Readers are advised that the WIA QSL Collection may be inspected at most times during the week. A telephone call will be necessary in order to make the appointment.

A part of the collection may be borrowed by radio clubs for the purpose of display. Also, photostatic copies of QSLs may be made available to radio historians who are considering writing an article on radio operation.

Most of the QSLs of the more active radio operators, both pre-war and post-war, are in the collection. Through liaison with other societies trying to save something for the future, an exchange system with other countries has been established.

If you, as a reader of the series of articles entitled "QSLs from the QIA QSL Collection", are interested in contributing a few of your own QSLs, please contact the honorary curator of the collection. Ken Matchett VK3TL, 4 Sunrise Hill Rd, Montrose. Ph: (03) 728 5350.

CONTESTS

Peter Nesbit VK3APN *

Contest Calendar May-July 93

May 1/2	ARI (Italy) CW/SSB/RTTY	(Apr 93)
May 8/9	CQ-M (Russia)	(Apr 93)
May 29/30	CQ WPX CW	(Mar 93)
Jun 5/6	RSGB Field Day CW	
Jun 12/13	ANARTS WW DX RTTY	
Jun 12	VK/ZL/P29 80m Sprint	
Jun 19/20	WIA Novice Contest	
Jun 26/27	ARRL Field Day	
Jul 1	Canada Day CW/Phone	
Jul 3/4	Venezuela SSB DX	
Jul 10/11	IARU HF Championship	
Jul 24/25	Venezuela CW DX	

In the "General Rules" published last month, the suggestion to mark contacts as "solicited" if they fit certain criteria may have puzzled a few readers. The suggestion actually originated from a contest manager in the USA, following a 160m contest in which the log of a particular W contained a number of Caribbean call signs which did not appear in anyone else's log, and significantly improved his multiplier. The manager's initial reaction was to disallow the contacts (as can happen, rightly or wrongly), however upon contacting the stations concerned he discovered that they resulted from skeds made by the W, and were therefore perfectly valid. In his summary of the contest he said that prior planning such as this could only help the contest, however for their own protection, stations making skeds ought to bring that fact to the attention of the contest manager. Bear in mind that the suggestion is by no means mandatory, and that contacts marked as "solicited", "sked" or whatever will usually be more closely scrutinised.

If you receive an award in one of the smaller DX contests, there is a good chance that a copy of the results and rules for the next contest will be included. If so, it would be appreciated if you would send this information (or a copy) to me for inclusion in this column. As some of the smaller contests are poorly publicised, and the results hard to obtain, here is a good opportunity to help with publicity.

Until next month, good contesting!

73
Peter VK3APN

Contest Details

The "General Rules & Definitions" published in April AR apply to the following contests, except as otherwise indicated.

RSGB Field Day

June 5/6, 1500z Saturday to 1500z Sunday. This CW contest usually stimulates considerable portable activity in the UK and Europe. Overseas stations are invited to participate and submit a log, but otherwise are ineligible to compete. Certificates will be awarded to the overseas stations in each continent making the most contacts. Send log to: RSGB HF Contest Committee, PO Box 73, Lichfield, Staffs, WS13 6JJ, England.

ANARTS WW DX RTTY

June 12/13, 0000z Saturday to 2400z Sunday. This contest is organised by the Australian National Amateur Radio Teleprinter Society, and runs on the second full weekend of June each year. The object is to contact as many stations locally and overseas as possible on 80-10m (no WARC bands), using any digital mode (no satellite). Categories are single & multi operator (one TX only), and SWL. Max operating time is 30 hrs single op, 48 hrs multiop. Messages comprise RST, TIME, ZONE. Contacts are scored according to zone worked, and the following tables show the points for each zone worked, in order from 1 to 40 (left to right, top to bottom):

Your Zone = 28:

31	40	40	44	45	49	53	51	55	54
49	48	48	32	30	26	22	20	20	25
20	11	14	10	15	05	07	02	10	17
31	24	34	25	36	30	22	26	19	34

Your Zone = 29:

39	50	43	52	54	47	49	54	52	44
42	37	37	42	39	36	32	30	30	34
28	21	24	20	23	16	15	10	02	09
15	32	42	33	39	31	24	24	20	44

Your Zone = 30:

35	50	35	44	46	38	40	44	45	37
41	33	34	49	47	42	38	33	32	43
37	29	30	24	30	22	18	17	09	02
24	07	51	42	47	40	33	32	29	48

*Here is an opportunity
to enter a fun event,
whilst being competitive . . .*

Countries per ARRL DXCC list, except that mainland VK, VE, JA and W are not counted as countries, and instead each call area in mainland VK, VE, JA and W counts as a separate country. Call areas outside these mainland areas (e.g. VK0, JD1, KL7, KC4) do count as separate countries. One's own country does not count as a multiplier (ie VK call area).

Points are determined for each band and then added. Countries are similarly tallied. Continents are those worked on all bands (max 6). Total score is: points x countries x continents. Send log to: Contest Manager, ANARTS, PO Box 860, Crows Nest, NSW 2065, by 1st September. Official rules and a full page scoring table are also available from ANARTS upon receipt of a SASE.

VK/ZL/P29 80m Sprint

June 12, Saturday 1230-1330z. This inaugural event is organised by the Redcliffe Radio Club of Queensland, and honours the late Merv Stinson who helped many amateurs in various ways through the auspices of the club. As a sprint, the object is to contact as many stations on SSB as possible, in a 1 hour period. Frequencies are between 3.535 and 3.7 MHz. Both single and multi operator entries are welcome, also SWL.

Exchange RS + serial number (leading zeros are optional, ie 591 can be used instead of 0591). The score is the number of stations worked (no multipliers). Send log to: Contest Manager, Redcliffe Radio Club, PO Box 20, Woody Point, QLD 4019, by COB 19 July. Certificates to the highest scores (1) overall, (2) in each VK call area, (3) in ZL, (4) in P29, and (5) rest of world.

Here is an opportunity to enter a fun event, whilst being competitive with other stations, and at the cost of only one hour on a Saturday evening! Other sprints are also planned.

ARRL Field Day

June 26/27, 1800z Saturday to 2100z Sunday.

This mixed mode contest is open to W/V/E. As with the RSGB Field Day (see above), overseas stations are invited to participate and submit a log, but otherwise are ineligible to compete. Exchange RST + QTH, W/V/E will send operating class + ARRL/CRRL section. Send log postmarked by 27 July to: ARRL Field Day Contest, 225 Main St, Newington, CT 06111, USA.

Results of 1992 RSGB 21/25 MHz SSB Contest

ZL1AAS won the Oceania section with 2754 points, and VK9CC was second with 174 points. Alan Winter (VK6) was 5th outright in the SWL section with 2633 points. There were no other VK entrants.

1993 WIA VK Novice Contest

19/20 June 1993, 0800z Saturday to 0800z Sunday.

The object of this contest is to encourage amateur operation in Australia, New Zealand and Papua New Guinea, and particularly to promote contacts with novice and radio club stations. Only stations in VK, ZL and P2 call areas are eligible to participate.

All operations must be confined to the novice frequency allocations in the 10, 15 and 80m bands, viz 3.525-3.625 MHz, 21.125-21.200 MHz and 28.100-28.600 MHz. No cross-band operation is permitted. Stations in the same call area may contact each other for contest credit.

Sections include (a) Phone-novice/full call; (b) CW-novice/full call; (c) SWL. Except for club stations, no multi-operator operation is allowed.

Phone stations call "CQ Novice Contest". CW stations call "CQ N". Exchange a serial number comprising RS (or RST) followed by three figures commencing at 001 for the first contact and increasing by one for each subsequent contact.

Any station may be contacted twice per band, provided at least 12 hours has passed since the previous contact with that station. SWLs may log up to 10 sequential contacts made by a station, and then must log no less than another five stations before logging that station again. The five stations so logged need a minimum of one contact only logged.

Score 5 points for contacts with novice or combined call stations, 10 points for contacts with club stations, and 2 points for contacts with full call stations. SWLs score 5 points for novice to novice contacts, 2 points for novice

to full call or full call to full call contacts, and 10 points for contacts made by a radio club.

Logs must show: Date/time UTC, Band, Mode, Station contacted, Report and serial number sent, Report and serial number received, Points. Each log sheet must be headed "VK Novice Contest 1993". The total claimed score for each page must be shown on the bottom of the page.

Attach a summary sheet showing all standard information (refer to "General Rules & Definitions" published last month). In the case of a club station, the summary sheet must be signed by a responsible officer of the committee, or a licensed operator delegated by the committee to do so.

Entrants may submit only one contest log per mode. Logs for entries where an entrant uses more than one callsign whilst operating in this contest will not be accepted. Send entries to: Novice Contest Manager, WARC, Box 1, Teralba, NSW 2264, to arrive by 23 July 1993.

The Keith Howard VK2AKX Trophy will be awarded to the novice entrant with the highest aggregate (phone and CW) score, and the Clive Burns Memorial Trophy to the novice entrant with the highest CW score (these are perpetual trophies on permanent display at the Executive Office). In each case, the annual winner will receive a suitably inscribed wall plaque as permanent recognition. Certificates will also be awarded to the top scoring novice stations in each call area, the top scoring station in each section, and to any other entrant where meritorious operation has been carried out. Awards are at the discretion of the contest manager.

Ray Milliken VK2SRM
Novice Contest Manager

VHF-UHF Field Day 1993

One last log has been received for the Field Day — from Eric Fittock VK4NEF. Eric scored a healthy 480 points using 2 metres FM only. Well done Eric.

I would be very pleased to receive any further comments on the possible Field Day rule changes described in last month's issue. After all, the whole aim of the exercise is to give people what they want.

Another suggestion just received is that there should be a second VHF-UHF Field Day at some other time in the year. The proposal was for a mid-winter date, but other possibilities could be in spring, or in early December. (I believe there is a ZL field day in the first or second week of December).

John Martin VK3KWA
VHF-UHF Field Day Contest Manager

ARDF Region 3 Contest Beijing, October 1993

The WIA is sponsoring a team for this event with Wally VK4DO as contest manager. Contestants under 40 years of age are still required.

Approximate cost is \$2,500.00.
Full details are available from Wally, VK4DO QTHR.

The closing date is 30th June 1993

* Federal Contest Coordinator
24 Sovereign Way, Avondale Heights, 3034

Club Corner

South East Radio Group Inc

Well, folks, the time is fast approaching when that special weekend in June comes around. Of course I'm talking about the ever-popular South East Radio Group Annual Convention to be held over the weekend of 12-13 June 1993.

The South East Radio Group has set a standard for amateur conventions which is unsurpassed in Australia. A good balance is maintained between trade displays and competitions to ensure that a wide range of tastes is catered for.

This year we are still offering many exciting events which include the Australian Fox Hunting Championships. As has become the practice, additional emphasis is to be placed on the Home Brew competition. Traditionally this competition may not have been very encouraging to beginners to the home brew arena, so we will continue to provide a number of sections to cater for the novice to expert. We hope this will encourage everyone who likes to dabble in home-built equipment to show their prowess and compete for some attractive prizes.

The South East Radio Group convention promises to be a very popular spot on the amateur calendar, so make sure you don't miss out by booking your accommodation early. A list of recommended motels and caravan parks is available by writing to the Convention Co-ordinator at the address below.

Hope to see you there.

Convention Co-ordinator
SERG,
PO Box 1103,
MT GAMBIER 5290

South Coast Amateur Radio Club News

The South Coast Amateur Radio Club Inc would like to invite you to attend the inaugural "South Australian Technical Symposium". This event will be held on Saturday 24 July 1993.

The aim of this event is to promote experimental and home brew aspects of amateur radio today. Thirteen lectures will be presented covering the following topics:

160m Home Brew Equipment (John VK5BJE)
Amateur Microwaves (Des VK5ZO)
Packet Radio (Terry VK5GU and Grant VK5ZW)
Short Wave Listening (Jerome van der Linden)
Amateur Satellites (Graham VK5AGR and Garry VK5ZK)
6m-23cm Propagation (Eric VK5LP)
VLF/HF Techniques (Lloyd VK5BR)
VHF/UHF Construction and Equipment (David VK5KIK)

Home Brew Antennas (Peter VK5TZK)
Politics in Amateur Radio (Geoff VK5TY)

WIGEN

The event will be held at the Kingston TAFE College, O'Halloran Hill in Adelaide. Lunch, morning and afternoon teas will be provided, as well as a copy of the notes from all lectures. The presentations will be organised in three streams, allowing a choice of topics to be

selected. The WIA (VK5 Div) Equipment Supplies, Kits and Publications will also be available during the day.

If you are interested in attending, please register by 9 July, as places are limited. To register or obtain more information, you can contact Grant Willis (VK5ZW) on telephone (08) 277 3077, or Peter Cockburn (VK5GTZ) on (08) 278 6703 between 7-9pm CST. You can also send a packet mail message to VK5ARC@VK5TTY.#ADL.#SA.AUS.OC or contact us by post at: SA Technical Symposium, C/- South Coast ARC Inc, PO Box 333, Morphett Vale, SA 5162.

We hope to see you at the symposium!
Grant Willis
Secretary

Radio Amateurs Old Timers Club

The March meeting of the Radio Amateurs Old Timers Club took place on Wednesday 31 March at the Benthleigh Club. Forty-seven members and friends attended.

Members present were advised that Alex Stewart VK3BMS had reluctantly stepped aside as president due to the continuing illness of his wife.

John Fullager VK3AVY, who operates on 20 and 80 metres in the club's monthly broadcasts, has agreed to stand in until the annual meeting in September.

This meeting was historic in so much as the speaker was Alan Campbell-Drury VK3CD who, as VK3ACD, was one of the three wireless operators in the ANARE expedition to Heard Island in 1947/48/49. The member who introduced him was Quentin Foster who, as VK3QF, was the first operator to make contact with Alan, who was using a type A mark 3 transceiver with five watts CW output. This little rig from VK3ACD to VK3QF was the only communication from Heard Island to Australia for a couple of weeks as the high power official transmitters had been damaged by sea water.

Alan and Quentin had not met in the years since that time, so their eyeball QSO was memorable.

A founding member of the club, Lay Cranch VK3CF, had passed away the day before the meeting, but this did not become known until the following day (See obituary notice in this issue).

Members and listeners are reminded that our monthly broadcast is now repeated at 8:30pm Melbourne time on 3.635 megahertz. The operators are Ron VK3OM and John VK3AVY.

Allen Doble VK3AMD

Cairns and Tablelands Amateur Radio Clubs

If you are thinking of visiting Far North Queensland in the September school holidays come to the Far North Queensland radio convention and meet local and visitors.

The Far North Queensland Biennial Convention, to be held from 24-26 September 1993. Hosted by the Cairns and Tablelands Amateur Radio Clubs, PO Box 1215, Cairns 4870.

Venue: Ivanhoe's football club hall at Trinity Beach, which is actually 15 minutes drive from the centre of Cairns, and only five minutes drive from the beach

Accommodation: There are a number of motels, hotels, holiday units and caravan parks within 10 minutes drive from the venue.

Program

- Friday: 1800 Get to know you function
Saturday 0900 Registration
1000 Welcome and opening address
1045 Morning tea
1100 Session number one
1300 Lunch
1400 Session number two
1530 Afternoon tea
1600 Session number three
1750 Socialising, drinks etc.
2000 Conference dinner
Sunday 0900 Ladies trip to town departs
1000 Session number three
1115 Auction
1145 Ladies trip to town returns
1200 Convention closure and BBQ lunch

Contact person Chris Parr VK4ANI (070) 510452
Larry VK4WWW
Packet John VK4JON@VK4AFS.
#NQQLD.AUS.OC

News from Moorabbin District Radio Club

The club obtained permission from DoTC to operate the club station VK3APC on HF, VHF and UHF at a site on Mt Donna Buang for the John Moyle field day. David VK3JUP and Trevor VK3JJR were the prime movers, and others assisted and the whole crew did a great job.

The club is now registered as providing examination services. The member to contact is Andrew Bell VK3WAB, QTHR, and he is assisted by Brian VK3EOZ and Jerry VK3MO. The first two applicants were successful.

On Sunday 3 April and Monday 4 April, small groups of members and friends had conducted tours of the large and little-known radio and radar museum of the Civil Aviation Authority at Essendon Airport. This visit was arranged by Bill Babb VK3AOB by kind permission of the curator Mr Roger Myer, and with the much-appreciated co-operation of Mr Hughie Hopkins, Mr Phil Brodenick, Mr Bruce Farr and Mr Ken Matthews, all of whom are Civil Aviation staff.

Allan Doble VK3AMD

NSW Mid-North Coast Field Day

Due to the large crowd experienced last year, the 1993 ORACS Field Day, held over the Queen's Birthday long weekend in June, will be at the Wauchope Showground. Lots of room and good parking.

The event will be over TWO days — Saturday and Sunday 12-13 June. This will give everyone an option of either day to bring or buy their favourite piece of radio or computer equipment. Local and national traders will also have their stands there with the best buys in town. It is also hoped that the ladies will again have a stand of "non-amateur" wares as a "bring and buy" bargain sales activity.

As in previous years, there will be the usual fox-hunt and contests for home brew equipment etc.

The local 2m repeater is on 146.7. Event brochures and maps of the area can be obtained in advance by writing to: The Hon Sec ORACS, PO Box 712, Port Macquarie, NSW 2444.

We are not the largest field day in NSW, neither are we the smallest — but we are the 'friendliest'.

Tel and Fax (065) 85 2647
David A Pillely VK2AYD
Publicity Officer
Oxley Region Amateur Radio Club
PO Box 712
Port Macquarie NSW 2444

Warrnambool Amateur Radio & Electronics Club

The Warrnambool club has grown from just five members in 1988, to 40+ in 1993, and approximately 10+ other amateurs who contribute at any of our special functions.

We have seven licensed examiners with 10 novice students presently undertaking the Novice course. Six students have already passed their Regulations, and the other four were sitting on the 8th April (hopefully all have passed).

QSL Distribution Centre

The WIA has graciously made the club a QSL distribution centre for our area, so if anyone wishes to use the Warrnambool club as their QSL centre, please feel free to ring the

club President, Ian Durston VK3VID on (055) 62 8684, or write to the club WAREC, PO Box 724, Warrnambool Vic 3280.

General Activities

Our monthly meetings are held on the 3rd Tuesday of each month at 730pm. The venue being at the SEAL Complex, 71 Hyland Street, Warrnambool. Each month we try to have special guests who are both informative and practical.

We produce a monthly magazine which is sent out to all members and interested persons, with such information that concerns the club and surrounding district activities. Advertising in this magazine is free, with a distribution radius of 150 km. If you have transceivers, receivers, antennas etc for sale, please forward the information to the secretary.

Membership

Our annual membership fees are very much in line with other clubs being \$15.00 for full membership, and \$5.00 for pensioners, unemployed or students. Family membership is \$25.00. The membership fee entitles members to the monthly magazine, discount facilities at a couple of local electronics stores, plus numerous other advantages that come from belonging to a club.

73
Marilyn Durston
Secretary WAREC
PO Box 74
Warrnambool Vic 3280

Awards

John Kelleher VK3DP Federal Awards Manager

First a reminder about two VKB Awards from Alan VK8AV -

The Outback Award — requires 3 QSOs with members of the Alice Springs ARC or 3 QSOs with the same member on 3 separate occasions;

The Rev John Flynn Award — is in memory of Flynn of the Inland and has the same QSO requirements as the above. Fees for the Award are \$5.00 in any currency. The above requirements are not strictly enforced.

Applications for these Awards should go to The Awards Manager

ASARC
Box 2953
Alice Springs NT 0871

From Bob VK4DRM comes news and a sample copy of the "Moreton Bay Boating Paradise Award", which is awarded by the Bayside District ARS.

To qualify for this Award, VK stations must earn a total of 5 points (DX Stations require only two points) by working individual club members or joining the Club Net which is run every Wednesday at 1930 UTC on 21.80 MHz +/- QRM. Club station VK4BAR is worth 2 points. A Club Member station is worth one point.

Applications including a copy of the log showing name, address, callsign, and details of date, time, band and stations worked should be sent to

The Awards Manager, Bob VK4DRM,
C/o BARS
PO Box 411
Capalaba QLD 4157

Please include \$5.00 to cover cost of Award and postage.

Lithuanian Awards

Two Awards are offered -

LY Trophy

This award is available to any amateur confirming two-way contacts with LY stat one Ocean's stations require 5 station contacts. You must send GCR 1st and \$US5.00 or 10 IRCs or equivalent.

Baltic Way

The Baltic Way award is available to any amateur confirming two-way contacts with three Baltic States: ES (1 QSO), LY (1 QSO), YL (1 QSO) in 24 hours. Send GCR 1st and \$US3.00 or 6 IRCs or equivalent. The same rules apply to SWLs.

Applications should be sent to -
Award Manager
PO Box 1000
Vilnius, 2001
LITHUANIA.

IARUMS — Intruder Watch

Gordon Loveday VK4KAL *

The International Amateur Radio Union Monitoring System (IARUMS) is set up to record, report, and encourage the removal of non-amateur stations from amateur band allocations. Stations targeted are usually broadcast or commercial stations from other countries. Priority is not given to local "pirates". Each country appoints a Co-ordinator, who is responsible for collating reports and forwarding them to the appropriate regulatory authorities (DoTC in Australia).

Each WIA Division, apart from VK3, has a Divisional Co-ordinator to collect reports from that Division and forward them to the Federal Intruder Watch Co-ordinator. But the main strength of the service is in the individual amateurs who spend time regularly listening on the bands and identifying types of signals and stations.

More Intruder Watch listeners are always required. Volunteers who contact either their Divisional Co-ordinators or me direct will be supplied with information, log sheets and tapes to assist in identifying modes.

UMS Reports

The IARUMS is asking for reports of UMS on 7008 kHz for March and April 1993. Possibly not much will come from the VK area, as the station is in MURMANSK ! (still, the move is a good one).

The Chinese station normally found on 14068 kHz has now moved down to 14053 kHz, and still continues to send marker pulses and data.

Each month sees an increasing number of "Letter Beacons", mainly in the 40m band.

Now who said Intruder Watching was uninteresting? It is a good means of filling in time, while you wait for your sked. Try it!

Monitoring Service Update

Broadcast station on 7020 kHz is being constantly jammed and is a good example of how effective jamming can be.

The interference occurring around 14250 kHz has been identified as Radio Korea, sited at Pyongyang.

Please remember that the 80 metre band is shared and is therefore legitimately used by non amateurs.

Good News

RSGB reports that the NATO Naval data station often reported on 18081 kHz has shifted as a result of the co-operation between RSGB Monitoring System and UK authorities. This popular CW frequency is now the exclusive domain of amateurs again. Another win for the IARUMS.

SARTS MS Co-ordinator 9V1JY reports that as well as the Chinese Military data bursts on 14053.5 kHz, a station using the same methods (marker pulse and data bursts) has been

logged a number of occasions on 14063.5 kHz. A CW station ID VVH is being heard in R3 daily on 21368 kHz.

Jamming is being reported on all bands by JARL. More info is being sought to try and identify the source.

Frequency Occupation Survey. Richard Baldwin WIRU, President of IARU extends his congratulations and thanks to all those MS members who participated.

Now some more on Jammers

Stepped tones

Those signals usually consist of 3 or 5 separate audio tones transmitted in the order of first increasing and then decreasing pitch, repeated over and over again.

Random noise

Noise is random, both in amplitude and frequency. Since recurring frequency, it cannot be filtered out or otherwise eliminated without removing the desired signal. It produces a sound similar to that heard when a receiver is not tuned to a station and the volume control is turned to maximum.

Random keyed modulated CW

This signal consists of a continuous wave keyed at random and modulated by superimposed spark noise.

Rotary

This signal is produced by a low pitched, slowly varying audio freq. The result sounds like grunting.

Gulls

Consists of a quick rise & slow fall of varied audio frequency. The sound is similar to the call of a seagull.

Mills

The sound of this signal resembles the monotonous repetition of high speed machinery, repetition rate is usually constant.

Tone

Consists of a single freq of unvarying tone. Most often used to jam modulated transmissions.

Webbier

Is a single frequency, modulated by a low, slowly varying tone, resulting in a howling sound.

This information was supplied by Rohan Wahrlich ZLICVK, Region 3 MS Co-ordinator.

For the beginning of Jammers see April AR. I hope the information will help observers, and let all those others become more aware of the need to continually monitor our hard won frequencies.

Listed below are lists of recently logged intruders into the amateur bands:-

Summary of intruders for February 1993

Freq	UTC	Date	ID	Mode	Comments	X
7002.5	1145+	180293	V	A1A	Beacon	33
7005	1111	205293	—	—	Indonesian b/c stn	—
7039	2045	120293	C	A1a	Beacon	2
7029.4	1115+	180293	F	A1a	Beacon slow cw	15
7048.9	2035	110293	UHF3	mxid	F7b/F1a, 5 fig gr	30
10102	1135	180293	LRB74	A3c	Wx fax. Drum sp 120 rpm	—
10110	2112	120293	—	F1b	Data 140 bd sync	3
10115	2020	130293	—	A3c	Wx fax China	2
10120	0850	100293	—	A3j	American fisherman	—
10142	2115	120293	—	F1b	Data 140 bds sync	—
14053+	0718+	010293	—	mxid	Non, F7b data bursts	12
14056	1100+	180293	—	mxid	as above, Chn 28	—
14128.5	0957+	010293+	—	F1b	rtty + non 8	—
14140.5	0510	230193+	MNR	mxid	UMS group 250Hz, 80bd CIS	14
14210	1133+	180193	—	A3e	2f of 7105	35
14211.5	1130+	180193	—	A3e	2 sigs 3rd reg cyr CIS	11
14220	0930	230293	—	R7b	—	—
14238	0535	190293	—	R8b	—	—
14282.2	1155+	260193	VRQ	A1a	tic & calling MKHJ, UCP Vtn	—
14288	as above,	showing spread of trans	30	loggings	—	—
14250	mny	daily	—	mxid	Pxxx + non, jam 5/6 kHz	—
21009/15	mny	daily	—	non	Carrier varies 6 kHz	18
21031.5	mny	daily	MNR	mxid	atf/f1b UMS group CIS	16
21289.35	mny	daily	MNR	F1b	RTTY, 110 bds sync CIS	20
21315	0547	080293	—	R7b	4kHz wide	—
21368/9	mny	daily	VVH	A1a	I.D. brd 9	—
21448/50	1134	daily	R.Mos	A3e	B/c stn ? tail end of id?	—
24925	0912	060293	Tass	A1a	cls x 3/AJOL FXU &C	—
24942	0132	0602	—	A1a	Marine radio tic. HKong, 217	—
24950	1036	1302	—	A3e	B/c stn Chinese lang	2
28350	0725	170293	—	A3e	B/c stn Russian dialogue	—
Many PXX and NON signals heard of late, mostly OTHR.						
Logs this month from VKs 4BG, 4AGL, 4AKX, 46XC, 4BTW, 6RO and 6XW						

Summary of Intruders for March 1993

Freq	UTC	Date	ID	Mode	Comments
7002.5	1200	220293	A1A	V BEACON 21	
7039.5	1055	220293	A1A	F BEACON + C BEACN 30	
7048	1050	220393	MXD	UHF3 ON F7B + FICW 5	
7049	2100	1903	MXD	F1B/DATA 140 BD SYNCRO 2	
10103.3	1133	210393	A1A	SERIES LONG DASHES	
10115	2130	1803	A3C	WX FAX DAILY CHN 30	
14002.6	1018	020393	J3E	B/C ASIATIC SP	
14006/8	1305	2303	XXX	JAMMER	
14018.4	1023	020393	A2A	CODED LTRS/DATA	
14061.5	0720	0503	MXD	F7B/NON/DATA BURSTS 16	
14033	0540	1803	A1A	LONG SERIES DASHES	
14040.5	0710	220393	F1B	140 BAUDS SYNCRO	
14053	0755	2203	F7B	DATA BURSTS DAILY 17	
14105	0043	2303	F8	2 DIFFERENT TONES	
14117.2	1110	080393	NON	STEADY CARRIER	
14125/7	MNY	MNY		3 TX TOGETHER/RTTY CIS	
14140.5	MNY	DLY	MXD	UMS CHAIN 140BD CIS 27	
14210	0050	0103	A3E	CHIN FEMALE 2H/105 18	
14212	1003	080393	F1B	RTTY NO SHIFT GIVEN 4	
14214.5	1030	0503	MXD	A1A/F1B FIG GRPS	
14250	MNY	DLY	NON	PLUS JAMMER 14	
14283	1312	2803	A1A	UMS/F1B FIGS CIS 2	
14285/7	MNY	DLY	A1A	VRQ MSGS /TFC VTN 31	
14338	2230	190393	A3C	WX FAX	
21031.5	MNY	DLY	F1B	UMS GROUP 250HZ FIGS CIS 17	
21283.5	1050	2202	MXD	MAIN OUT UMS CHAIN CIS 12	
21315	1207	1903	A3E	B/C STN MUSIC	
21406	0130	010393	A3E	RADIO MOSCOW CIS 5	
210000	1159	1803	F3	B/C FM MODE	
24928	0158	0103	A1A	MARINE SHIPPING TFC	
24962	1223	0103	A3E	MILITARY TX ASIA	

Many military transmissions are heard around the 24.960 MHz area, also in the 10m band, also harmonics (?) of lower broadcasters, or are we hearing fundamental freqs in these bands now?

Logs included this month VK's 4BG, 4AGL, 4AKX, 4BTW, 5TL, 6RO, and 6XW

Many thanks,
VK4AL FIWC

* Federal Intruder Watch Co-ordinator Freeport No 4 Rubyvale Qld 4702
or VK4KAL@VK4UN-1

FTAC Notes

John Martin, VK3KYA, FTAC Chairman

New VHF-UHF Records

There are several new VHF-UHF records to announce this month, three of which were made during the VHF-UHF Field Day on January 15/16.

Chris Davis VK1DO has broken the ACT record for 1296 MHz twice, and 432 MHz once. Operating as VK1W/P, Chris worked Arie Groen VK3AMZ on 14/3/92, for a new VK1 1296 MHz record distance of 5071 km. On 15/1/93, he operated from Mt Ginini and set new ACT records for 432 and 1296 MHz by working Ross Berlin, VK2DVZ over 542.8 km. Congratulations to Chris, Arie and Ross.

Rod Preston VK4KZR and Doug Friend VK4OE set a new Queensland record for 1296 MHz on 16/1/93. Rod operated from Mt Mowbullan and Doug's station was near Siding Springs in the Warrumbungles. The distance was a very healthy 544.7 km.

Wal Howse VK6KZ and Ross Tolchard VK6KAT have claimed the first ever 10 GHz record for Western Australia. On 28/2/93, Wal

operated from the Cape Naturaliste lighthouse and Ross was on the highway between Roelands and Collie. The distance is 85.1 km. Both stations used ex-military tellurometers model MRA301.

Warning of possible RF Safety Hazard

Lyle Patison VK2ALU, who is FTAC's microwave advisor, has provided this warning on the use of 10 GHz tellurometers:

These tellurometers use a klystron with a CW power output of about 10 mW, and have a 317 mm dish with a stated gain of 27 dB. This represents a likely ERP of about 5 watts, which would result in a power density of about 6 mW per square centimetre at the dish aperture. With the cassegrain reflector unclipped, the power density would be about 4 mW per square cm.

Both of these densities are above the recognised safety limits.

A tellurometer should not be operated indoors on its tripod, or outdoors when access is available to the front of the device. This could put people — especially children — at risk because the source of RF radiation would be very close to eye level.

A further warning: do not remove the subreflector and look into the open end of the waveguide when the device is operating.

Pager Interference — Light in the Tunnel?

Two American firms, Scientific-Atlanta and Motorola, are about to begin production of equipment for the Iridium global communications program.

This is a world-wide, cellular, personal digital communications system for use with low earth orbit (LEO) satellites. The first satellites are to be launched in 1996 and the system is expected to be complete by 1998.

The good news for amateurs is that the LEO satellites, which will orbit the earth at an altitude of about 780 km, will use the bands 135 — 138 and 148 — 150 MHz, which were allocated at the last WARC. The higher of the two bands conflicts with the Australian pager band, and it seems inevitable that the pagers will have to be moved.

Almost all channel 5A TV stations are already scheduled to move during the next few years, but the use of 135 — 138 MHz by the LEO satellites will help to guarantee that the move goes according to schedule.

Microwave Pay TV

New Zealand amateurs recently lost most of their 13 cm band when their government decided to sell off 2300 — 2398 MHz to the highest bidders.

Now the same thing is about to happen here. As well as satellite pay-TV, we will soon be saddled with microwave pay-TV using the existing MDS band — despite the fact that ground-based microwave systems just cannot provide the broad area coverage needed for public broadcasting.

It appears that known technical facts do not carry any weight when the profit motive comes to the fore.

Our 2300 — 2450 MHz band is shared with other services, including fourteen MDS channels between 2302 and 2400 MHz. Once these channels are sold for pay-TV, the MDS services will have to find space elsewhere, and this could pose a threat to 2400 — 2450 MHz as well.

It may be too late to prevent this squandering of a public resource for private profit, but there is a chance that the government may reconsider if they can be persuaded that the MDS proposal is technically impractical.

I would urge all amateurs interested in preserving this band to start writing letters

**Prevent pirates —
make sure you sell
your transmitter to
a licensed amateur.**

Pounding Brass

Gilbert Griffith VK3CQ

CW increasing!

A great deal of time and effort went into adjudicating this year's 43 events. Interestingly, the number of UK entrants in CW contests is increasing whilst SSB contests are struggling.

Morsum Magnificat

Comment on HF contests in the Annual Report of the Radio Society of Great Britain, 1991-1992 courtesy Morsum Magnificat #26. Also in Morsum Magnificat #26, is the following article

"The first ever UK Class 'A' Novice, has now become the first UK Novice to receive the G-QRP Club's Class 'A' CW Novice Award.

He is 12-year-old Keith Goodwin, 2M0ACT, who used 3 watts to make his first 50 CW contacts to qualify for the award. These contacts include seven with USA/Canada, two with Indonesia, and involve twelve separate countries in all

His father Stuart GM0CAG, reports that Keith is getting a great thrill from the hobby and that many of his contacts have helped him relate to his school geography and French lessons.

Dave Gosling G0NEZ, the G-QRP Novice Services Manager, reports that there are a number of other Club Novices also achieving high standards of operating ability and asks all CW operators to look out for and encourage Novices when they hear them.

Novice callsigns have the prefix 2 followed by the letter E, W, M, J, U, or I designating their regional locations. 2M0ACT, for example, is located in Scotland.

The G-QRP Club's CW Novice Award is intended to encourage newcomers to CW operating. It is open to any amateur (including non-club members) who, during the first twelve months of holding a licence, contacts 50 different stations while using CW

The Class 'A' award is for contacts using up to 5 watts output and the Class 'B' award any power may be used. Further details are available from Gus Taylor G8PG, 37 Pickersill Road, Greasby, Merseyside, L49 3ND, England"

Increasing Your Speed.

This is not everybody's cup of tea, many of us are quite happy thank you, to plod along at 10 wpm or so. But if you have other ideas, maybe a hankering for some rare DX, or contest fever, you may want to do a little better. I know if I ever manage to get back into the shack I will certainly need to get my speed up all over again, because I sure am rusty.

By far the best way to improve your copying ability is to copy, off air, as much as possible. If your aim is to improve your speed, then you should aim at trying to copy a little faster than you can at present. Naturally you are going to miss things, but many operators have found that if they set themselves high goals they will eventually achieve them. If you set your goals too low, you will achieve them, but where will you be then?

Due to the pressure of business, Gilbert Griffith VK3CQ has advised that this will be his last column of "Pounding Brass".

The Editors and the Publications Committee thank Gilbert for the untiring voluntary effort he has displayed over the past five years. An endeavour very much appreciated by all of us at "Amateur Radio".

Morse Code is a very important part of our hobby, and we now solicit expressions of interest from enthusiasts prepared to write the "Pounding Brass" column. Please phone (03) 528 5962, or write to the WIA, PO Box 300, Caulfield South VIC 3162.

Depending upon which level you require will decide your present goals. The goals might be Novice 5wpm first, followed by full call 10wpm, then you might want to get over the 10-15wpm hump that confounds many beginners. Or you might just want to get your speed up so that you can use CW effectively on the air, the goals you set here will depend on whether you want to work contests, DX, or computers. If you can get a computer to copy your code at any speed then you have achieved a worthwhile goal, because they are extremely unforgiving of sending errors where a human operator will scarcely notice them. Many experienced CW operators will tell you that it is better to set out to learn to copy effectively off air right from the start. You will then have no trouble at all with the exams, but if you only set out to obtain a pass in an exam you will still have to learn how to receive off the air later on. A goal that many amateurs never achieve at all

Don't be frightened by the so-called "sound barrier" in learning Morse code. Many operators get to the speed of about 10wpm and are convinced that they cannot go any further. This is because of the three ways of copying code, and the barrier consists of learning each new way as your speed progresses. The first means of copying is that which everyone learns right at the beginning, and involves painstakingly copying down each letter as it is heard. The process can be observed by merely thinking about it.

The brain hears the character and looks it up in its memory, when it recognises the character it says "Aha that is a 'C'" and then tells the hand to write down the "C". This process is actually all right for most exams and for speeds up to about 12-15wpm... that "sound barrier" mentioned before. Once this barrier is reached you need to change to the second method of copying before your speed will show much improvement. The second method is called "character recognition" (the first method was "character look-up"). Here the sound of each character is instantly recognised and the

hand writes the character down without any intervening thought processes. At this stage it really helps a lot if you practice listening to characters sent at a MUCH higher speed than you are used to, it doesn't matter if you miss 50% of the copy, in fact this is a good point to aim for because it means you ARE copying at least 50% of the message at a lot faster than you are used to copying. It won't be long before you find yourself able to copy those 20wpm tapes that used to be meaningless, or that you are following conversations at well over 20wpm with ease.

At about this time, without your being conscious of it, your brain will begin to recognise words and phrases as single entities. You may notice that "dah d d d d d d d" begins to sound like the word "the", and DE and RST will take on meanings of their own.

Eventually you will recognise most commonly used words without even thinking about them, and when an unfamiliar one comes along your brain will be able to "pay back" the unknown word until it is recognised. The transition to this third method, called phrase recognition, is usually so slow that it goes un-noticed but somewhere about this time you will notice that you can comfortably relax and simply "listen" to the code while "hearing" the words and phrases in your mind, without the necessity of writing it all down.

You will be pleased to discover that your receiving speed is now so great that you can write fast enough to keep up.

7 Church Street, Bright VIC 3741

ar

NZART

BASIC RADIO TRAINING MANUAL
Single copies may be purchased from
NZART,

PO Box 40 525,
Upper Hutt NEW ZEALAND

The correct single copy price:

NZ\$21.75 including postage

10% discount on bulk orders of 10 or more

20% discount on orders over 20

This revised edition was reviewed
in the Education Notes in February
"Amateur Radio".

ar

STOLEN EQUIPMENT

YAESU FT/290 RII, serial number 9F240010
2m FM/SSB transceiver

Stolen from Y Rochford VK2BVR of 32 Craig
Ave, Oxley Park, NSW at around 2pm on 10
March 1993 Phone (02) 623 6378 or (02) 283
2444 Contact Constable Bathing at St Marys
Police station

BT

ALARA

Robyn Gladwin VK3ENX *

Future YLs at Geelong

Geelong Amateur Radio Club has begun an NAOCP class (CW, theory and regulations) for women and younger youth, ie 11-14 year olds. It is held on Wednesday evenings from 7:30 — 9 p.m. at the GARC clubrooms. Already there are 5 YLs, 2 boys aged 12 and 14, and a prospective YL aged 14.

The fees for the course are just club membership with concessions for pensioners and students. Towards the end of the year, the club hopes to run a special examination for this group with minimal fees as added encouragement.

Many thanks to Lee VK3PK for this information.

Maybe, other clubs will take up similar initiatives in order to keep our hobby alive in years to come.

ALARA Out and About

ALARA has been represented at a number of amateur radio events. Dorothy Bishop VK2DDB attended the Gosford Field Day at the Wyong racecourse. The ALARA display was located on the first floor of the airconditioned members' stand, and many YLs, either studying for their licences or interested in beginning a course, spoke with Dorothy. Among the YL amateurs at the Field Day were Beryl VK2BBM, Pixie VK2KPC, Marjorie VK3AMJ, Pauline VK2GTB, and Anne VK2MKJ.

ALARA was also part of the Barossa Amateur Radio Club Picnic at Mount Pleasant oval. This year, a section of the main hall was partitioned off as a "drop-in" centre and Maria VK5BMT, Meg VK5ACV, and Christine VK5CTY dispensed tea and coffee to ALARA members and interested visitors. Sighted at the Picnic were Lyndell VK5KLO, Sue Mahoney, Chris VK5TCC, Bev Tamblyn and Mary Rogers.

The ALARA banner flew at Mount Pleasant and is now on its way to Mildura where it will fly at the Two States — Sunraysia and Riverland Radio Groups Combined Convention on Saturday, 15th May, 1993.

YL meeting '93 in Osaka.

Christine Armstrong ZL1BQW has gone to Japan for the JA-YL Meeting. She has taken a set of souvenir spoons collected from different Australian call areas. Many thanks go to Poppy VK6YF, Bev VK8DE, Alan VK8AV via Maria VK5BMT, Meg VK5ACV, Helene VK7HD, Bron VK3OYF, Dorothy VK2DDB, and Val VK4VR, who donated spoons for this special occasion.

Young Amateurs

Speaking of young people, VK5 ALARA added an evening to welcome Adele Hope ZL1TMD a Rotary Exchange Student. Adele is 14 years old and has been made a sponsored ALARA member for 1993. She is looking forward to receiving her reciprocal licence. Adele, centre, is pictured at the Chinese restaurant with Jennifer, daughter of Lyndell Oates VK5KLO, and Michelle, daughter



of Joan Harris. Joan is presently studying for her amateur licence. Perhaps Jennifer and Michelle will be future ALARA members.

Another young amateur, Hirotsugu Tahara JM6EAW, aged 11, was welcomed to Australia by VK3 ALARA members in Melbourne. He and his mother, Akemi JK6ARD were on their first visit to Australia.

Pictured with the guests are, from left, Raide Fowler, Robyn Gladwin VK3ENX, Mavis Stafford VK3KS, Phyl Burstall VK3KYL, Erika Bartz VK3AEB, and Gwen Tilson VK3DYL.

* PO Box 438 Chelsea 3196 VK3ENX@VK3YZW

Over to You — Members' Opinions

All letters from members will be considered for publication, but must be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Chuckie's definitely NOT a ham

I am one of those amateurs who, amongst the 2m and 70cm mobile FM amateur equipment, also has a popular brand mobile phone installed in my vehicle for business usage.

Things were going along quite OK, until I installed a mobile phone antenna on the rear window of the car, alas only approx one metre from the two metre quarter wave vertical antenna mounted in the centre of the roof.

On four occasions so far, I have succeeded in completely wiping out the memory settings of the mobile phone whilst transmitting 50 watts on 2m FM. On one occasion, the mobile phone really spat the dummy, as it lost ALL software settings, necessitating a visit to the dealer for a complete re-installation. The dealer was quite puzzled, and he had never heard of RFI, or Electromagnetic Compatibility (EMC). He mentioned that this was the third mobile phone re-installation he had performed during that week, and thought it a most strange event, but had no explanation for the cause of the problem.

Try as I might to explain the circumstances to the dealer, he found it very difficult to accept that the mobile phone obviously has a weakness in the front end, lacking in selectivity, and being unable to reject a strong nearby signal.

I bring this matter to the attention of other amateurs who may be contemplating a similar

installation, with a warning to ensure the mobile phone is at least covered by a guarantee against disintegration by strong local electromagnetic fields.

Finally, a message to Telecom's Chuckie: Amateur Radio Operators are very adaptable to most situations, and who is qualified to work out all of the intricate details? we are Chuckie, we are!

Bruce Bathols, VK3UV
6 Ann Court
Aspendale Vic 3196

AR layout changes

It looks very neat. The reduced size of print for the regular columns is a good idea and will allow more information to fit in the available space.

On the other hand, unless my eyes deceive me, the size of print for the technical articles has been increased again. Does this mean that the number of pages will be increased, or that the number of technical articles will be reduced?

John Martin, VK3KWA

Foreign Words

Personally I'm not too concerned whether Will McGhie (page 47 March AR) uses ANALYSER or ANALYZER, although I've never seen ANALYSIS spelt with a "Z", so perhaps that's why I prefer the look of "S". BUT I really must protest about the use of the non-existent word "LOANED" on page 26!

Admittedly, we are constantly being besieged with overseas reports, documentaries and films where LOAN (a noun) is used as a verb instead

of LENT, and that aforementioned word used instead of LENT; but we don't need to copy.

Australian (English) does not have the word LOANED n it, the word did not exist when I went to school, and you won't find it in the Australian Macquarie Dictionary today either!

If the original article on Hurricane INIKI had been written in, say, German, I'm sure it would have been translated into Australian so that most of us could read it. A little translation may have been appropriate here too!

Dick Smith Electronics may well have LENT Amateur Radio equipment, but I'm sure it never loaned (ugh) it!

Murray Burford VK5QZ
201 Balgair Rd
TORRENS PARK 5086

Editor's Note — Humble apologies, Murray. I should have checked my Macquarie ... VK3ABP.

Tape Version of AR

When reading the publication "Magazines for print-handicapped readers" I came across the following entry:

Amateur Radio
Monthly
4-track audio cassette
Produced by the Royal Victorian Institute for the Blind
Free

For amateur radio buffs. Complete copy of the print edition
Not once in the years I have subscribed to the print edition of Amateur Radio have I seen mention of this taped edition!

In my work as Extension Services Librarian — for people with disabilities — I contacted Unley Wells, the chief librarian of RVIB, to confirm that this facility is still available. And, in doing so, discovered there are 49 subscribers to the taped edition.

I wonder whether there might be more subscribers to the taped edition of Amateur Radio if the opportunity were taken to publicise its availability through the paper. What about an article regarding the subscribers' use of this format of the journal? By doing this, there may be readers who are able to introduce this taped format to some amateur operators who have difficulty reading the print format.

Elizabeth Pennington VK3NEP
32 St Georges Rd
Beaconsfield Upper 3008

Editor's Note — Many thanks for the information Elizabeth, we also were not aware that AR was being produced in the format listed as a regular event ... VK3ABP.

ABC Radio Traveller's Guide

I have recently received some information from ABC Radio which may be of interest to other amateurs who are also regular travellers like my husband Keith VK5MT, and myself Maria VK5BMT.

The Traveller's Guide to ABC Radio is an extensive publication that suffices when one is actually in the location of the local transmitter. However, there have been many occasions when we have tried to find the usual regional ABC programming like news and current affairs and also Australia All Over, when we were out of reach and have found that the HF Short

Wave Services are more numerous than listed in the Guide.

There are HF services on VLM4920 and VLO9660 in Queensland. VLM6140, VLM9610 and VLM15425 in WA, as well as VL8K Katherine and VL8T Tennant Creek, NT.

As amateurs with HF sets and aerials we found good reception in all locations on the WA frequencies while in that state last year and hope others may benefit from this information.

(Mrs) Maria McLeod VK5BMT
1 Hewkins Ave
Flinders Park SA 5025

It Can't Happen to Me!

During a violent storm our home was struck by lightning. Fortunately I have always switched my roof-mounted vertical to ground when not

in use — it was hit. I had thought the 25m high tower with numerous VHF and UHF antennas, just 100 metres uphill from us, would be the lightning target before us. I now know better!

Most damage seems to have occurred through the AC mains. HF and VHF rigs with AC PSU, and a number of household items were damaged; some beyond economical repair.

My return to the bands is now dependent on the kindness of the insurers. It DID happen to me!

Charles Allen VK2ALC
92 Beacon Hill Rd
Beacon Hill NSW 2100

PS. I like the new format of AR.

67

Spotlight on SWLing

by Robin L. Harwood VK7RH

I recently obtained a copy of the 1993 World Radio TV Handbook, published by Billboard. This edition was published in early January, but I was only able to get my copy through one of the major electronic chain stores. The 608 page handbook contains all the usual features, but it is worth noting that the the WRTH editorial staff has compiled other books such as "The WRTH Equipment Buyers Guide" and "The Traveller's Guide to World Radio". These two new publications are designed for the listener/DXer, whilst the Handbook proper seems to be increasingly oriented towards the professional broadcaster rather than the hobbyist interested in DXing or casual listening. Yet it still has a wealth of information on shortwave broadcasting stations that isn't found in any other source, especially on those smaller broadcasting outlets that often are low powered and hard to catch.

This 1993 edition does look different, because of the momentous political changes in eastern Europe and the former Soviet Union. Because the latter no longer exists, each nation is now listed separately, together with the broadcasting information. As well, the media scene is rather fluid and there is quite a deal of indispensable information on contact points and frequency usage. Most former Soviet states have rapidly developed their own broadcasting services, both internally and externally.

In past editions, there usually was an equipment review and this edition does have a smaller section. More extensive reviews are included in the separate "Equipment Buyer's Guide". All the other sections are included, such as satellite broadcasting services.

A new section at the back is devoted to clandestine broadcasting. Overall, the WRTH 1993 is invaluable, despite some of the shortwave information quickly becoming outdated. This naturally happens as the shortwave scene can rapidly alter; yet the Handbook still has a wealth of useful and needed data. The price is around \$40, from Dick Smith Electronics.

In March, Radio Moscow's English Service briefly carried a news item that the Russian

government was going to establish their own external service. Apparently the World Service and the other foreign language programming is apparently funded by the CIS secretariat. There is speculation when and if this comes about. Interestingly, the former "Mayak" and "Orbita" domestic networks, which are still carried through many of the "Commonwealth of Independent States" is funded from a similar source.

If the "Russian Wave" as the new Russian external service is reportedly going to be known only the future will tell. The external service in Russian on shortwave is operated by a separate company to that of Radio Moscow. Confused? Then welcome to the club!

African signals have been propagating into my receiver lately. The BBC Portuguese Service via Meyerion in South Africa is heard at 0530 UTC on 15105 kHz. The signal level varies from daily and it is a good beacon to southern Africa. As well, the VOA relay in Botswana is heard often on 15600 kHz in English between 0500 and 0700. Also the BBC Indian Ocean relay in the Seychelles comes in well around 0430 UTC with BBC World Service from Africa, until an unidentified Arabic programme comes up 30 minutes later.

There is a relay of Radio Japan on 7230 kHz between 0600 and 0800 from the BBC site in Skelton (UK). Signals here are very good at that time. As part of this co-operative agreement in sharing of transmitter facilities, the BBC is utilising the Yamata site to relay their Mandarin Service. Also Radio Japan reportedly has commenced using the BBC Far Eastern relay station in Kranji (Singapore) to get programs to the Japanese contingent in Cambodia with the UN forces. I don't have the time or frequency information yet.

Well, that is all for this month. Don't forget, you can reach me on Packet as follows: VK7RH @ VK7BBS or at the address at the foot of this column.

Until next time, the very best of listening and 73 — VK7RH.

* 52 Connaught Crescent, West Launceston Tas 7250

68

HF Predictions

Even Jerman VK3ANI

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column, the second column lists the predicted MUF (maximum useable frequency); the third column the signal strength in dB relative to 1 μ V (dBu) at the MUF; the fourth column lists the "frequency of optimum travel" (FOT), or the optimum working frequency as it is more generally known.

The signal strengths are all shown in dB relative to a reference of 1 μ V in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point

"standard" where S9 is 50 μ V at the receiver's input and the S-meter scale is 6 dB per S-point.

μ V in 50 ohms	S-points	dB(μ V)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	-2
0.39	S2	-8
0.20	S1	-14

The tables are generated by the GRAPH-DX program from FT Promotions, assuming 100

W transmitter power output, modest beam antennas (eg three element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST The major part of NSW and Queensland

VK SOUTH Southern-NSW, VKS, VKS and VKT.

VK WEST The south-west of Western Australia.

Likewise, the overseas terminals cover substantial regions (eg "Europe" covers most of Western Europe and the UK).

The sunspot number used to make these calculations is 68.9. Next month's predicted value is 65.9.

Tx : VK EAST Rx : AFRICA

UTC	MUF	dBu	FOT	14.2	16.1	21.2	24.9	28.5
1	10.4	11	8.3	6	-9	-26		
2	10.0	5	7.8	4	-8	-23		
3	9.6	-3	7.4	1	-9	-23		
4	12.5	1	9.8	3	0	-9	-25	
5	18.0	8	13.9	1	9	3	-3	-15
6	23.3	8	17.2	0	7	7	3	-4
7	21.5	6	16.1	1	7	7	2	-5
8	19.8	7	14.6	4	7	5	-1	-10
9	17.0	7	12.6	2	7	-7	-19	
10	14.7	8	11.0	8	4	-5	-15	-31
11	12.7	9	9.6	8	0	-10	-27	
12	11.4	11	8.4	8	-4	-15	-30	
13	10.2	16	7.9	9	-8	-25	-3	
14	10.2	23	7.6	9	-11	-31		
15	10.0	29	7.4	10	-12	-34		
16	10.0	27	7.4	10	-13	-35		
17	10.0	30	7.5	10	-13	-36		
18	9.5	31	7.2	8	-17	-38		
19	9.0	32	6.9	5	-23			
20	8.2	32	7.0	6	-21			
21	9.5	31	7.3	7	-18			
22	9.2	30	7.1	5	-22			
23	8.7	22	6.8	1	-25			
24	8.9	24	7.0	1	-20			

Tx : VK EAST Rx : EUROPE L/P

UTC	MUF	dBu	FOT	14.2	16.1	21.2	24.9	28.5
1	15.9	14	10.8	14	12	6	-4	-16
2	15.1	16	10.3	16	12	4	-7	-20
3	14.4	18	9.9	19	12	3	-10	-25
4	13.6	21	9.5	20	11	1	-14	-31
5	13.5	26	9.4	24	12	0	-16	-35
6	14.2	24	9.9	24	14	3	-12	-29
7	16.0	23	11.1	28	18	9	-3	-17
8	15.5	17	11.6	19	12	3	-9	-24
9	13.0	11	9.9	11	4	-4	-19	-36
10	12.0	2	8.8	5	0	-9	-23	
11	11.2	-6	8.2	1	-2	-10	-24	
12	10.7	-13	7.8	-1	-3	-10	-23	-38
13	10.5	-18	7.6	-2	-3	-9	-20	-35
14	10.4	-21	7.7	-4	-3	-8	-16	-32
15	10.4	-30	7.7	-9	-7	-12	-22	-37
16	10.0	7	7.5	-15	-13	-16	-39	
17	9.4	7	7.1	-22	-20	-26		
18	9.5	7	7.3	-19	-17	-24	-37	
19	11.4	-18	8.3	-5	-2	-6	-15	-27
20	15.0	-5	11.8	-7	1	-2	-4	-17
21	18.0	3	13.8	-6	3	-1	-8	
22	18.5	8	12.7	2	8	7	2	-6
23	17.5	11	12.0	8	10	7	0	-8
24	16.6	12	11.3	12	11	7	-1	-12

Tx : VK EAST Rx : SOUTH PACIFIC

UTC	MUF	dBu	FOT	14.2	16.1	21.2	24.9	28.5
1	28.2	24	21.2	34	36	33	29	23
2	28.3	24	21.3	35	36	34	29	23
3	28.1	24	21.2	36	36	34	29	23
4	27.7	25	20.9	38	38	35	30	23
5	26.4	26	19.9	42	39	35	29	26
6	24.3	29	18.4	47	41	36	28	18
7	21.7	31	16.4	47	39	32	22	11
8	18.2	33	14.5	45	36	27	15	-2
9	16.8	35	12.7	43	32	21	8	-4
10	15.2	37	11.4	40	27	18	-1	-18
11	14.3	38	10.7	39	24	10	-6	-25
12	13.6	39	10.1	37	21	7	-11	-31
13	13.0	40	9.7	35	19	4	-15	-36
14	12.6	40	9.5	34	17	2	-18	-
15	12.6	40	9.4	34	16	1	-19	-
16	11.6	41	8.8	30	11	-5	-27	-
17	10.3	43	7.9	25	3	-16		
18	10.1	43	7.8	24	2	-17		
19	12.9	39	10.0	34	18	3	-16	-37
20	16.2	31	14.0	39	31	23	11	-2
21	23.0	27	17.7	38	35	30	23	14
22	25.8	25	19.7	37	38	32	27	19
23	26.6	24	20.4	35	35	33	28	21
24	27.7	24	20.9	34	35	33	28	22

Tx : VK EAST Rx : ASIA

UTC	MUF	dBu	FOT	14.2	16.1	21.2	24.9	28.5
1	26.8	12	20.2	11	17	14	8	
2	26.8	11	20.9	8	16	17	14	8
3	27.1	11	20.6	9	16	17	14	9
4	27.4	12	20.8	10	17	18	15	10
5	27.4	12	20.9	12	18	19	16	10
6	28.7	13	20.4	15	20	19	15	9
7	25.1	14	19.2	20	22	20	14	7
8	22.9	16	17.4	26	25	20	11	1
9	20.9	19	16.7	34	26	18	7	-6
10	18.8	21	14.3	34	23	12	-2	-18
11	17.3	22	13.1	32	19	7	-10	-29
12	16.4	23	12.4	31	16	2	-16	-37
13	15.7	24	11.9	29	13	1	-22	
14	15.0	24	11.5	28	10	-5	-28	
15	14.3	25	10.8	25	5	-11	-35	
16	13.5	25	10.6	23	4	-14		
17	12.6	26	9.7	18	-5	-27		
18	10.7	27	8.2	6	-24			
19	10.2	27	7.9	2	-30			
20	13.4	25	10.1	21	0	-19		
21	17.8	21	13.9	30	20	-4	-20	
22	23.9	15	18.5	23	23	20	13	4
23	25.9	13	19.9	18	21	20	15	8
24	26.2	12	20.1	13	19	18	14	8

Tx : VK EAST Rx : MEDITERRANEAN

UTC	MUF	dBu	FOT	14.2	16.1	21.2	24.9	28.5
1	15.9	7	12.0	5	7	3	-3	-16
2	15.8	2	11.8	-2	3	1	-6	-16
3	14.9	3	14.0	-8	2	3	0	-6
4	23.4	3	17.7	-15	6	5	-5	-32
5	26.7	5	20.4	-19	1	5	0	-4
6	26.6	5	20.1	-19	-1	4	5	3
7	25.3	5	19.2	-17	0	4	5	2
8	23.4	5	17.6	-11	2	5	4	0
9	20.0	5	15.8	-5	4	5	2	-4
10	18.5	6	14.0	1	6	4	-2	-11
11	16.3	7	12.3	6	6	1	-4	-20
12	14.3	10	11.2	10	6	1	-5	-32
13	13.9	14	10.5	13	6	-4	-20	-39
14	13.3	18	10.0	17	5	-7	-26	
15	12.9	23	9.8	20	4	-10	-32	
16	12.6	26	9.5	20	3	-13	-36	
17	12.4	27	9.4	21	3	-14	-39	
18	11.6	29	8.8	18	-2	-22		
19	10.3	30	7.9	12	-12	-35		
20	10.1	30	7.8	10	-14	-36		
21	12.8	26	9.6	22	5	-11	-35	
22	15.3	26	11.8	29	18	7	-8	-26
23	14.6	20	11.2	20	12	-12	-29	
24	17.5	15	13.4	16	15	10	1	-18

Tx : VK EAST Rx : USA/CARIBBEAN

UTC	MUF	dBu	FOT	14.2	16.1	21.2	24.9	28.5
1	27.0	7	20.4	-9	5	8	8	5
2	25.7	10	20.5	0	10	12	11	7
3	24.2	13	19.2	-7	16	16	12	7
4	22.3	17	17.8	-20	21	18	12	5
5	21.3	21	16.9	-30	26	21	13	3
6	20.6	23	16.3	-35	29	22	12	3
7	18.5	25	15.0	-36	29	21	10	-1
8	18.7	24	14.5	-35	25	16	3	-10
9	16.9	24	12.8	-33	21	9	-8	-23
10	15.4	26	11.6	-30	16	3	-15	-34
11	14.5	26	10.9	-27	12	-2	-21	
12	13.8	27	10.3	-25	8	-6	-27	
13	13.2	28	9.9	-22	6	-9	-31	
14	12.7	29	9.5	-17	3	-12	-33	
15	12.5	14	9.5	-12	0	-12	-32	
16	11.5	6	8.8	8	-4	-16	-35	
17	10.1	-5	7.7	0	-9	-22		
18	9.8	-13	7.8	-1	-9	-20	-36	
19	12.9	-7	9.8	-3	-2	-9	-20	35
20	17.9	0	13.8	-8	0	0	-5	-19
21	22.6	3	17.4	-14	0	3	2	-5
22	25.1	4	18.2	-17	0	4	4	1
23	25.9	5	19.7	-17	0	4	5	2
24	26.5	5	20.1	-14	1	6	6	4

Tx : VK SOUTH Rx : AFRICA										Tx : VK SOUTH Rx : SOUTH PACIFIC										Tx : VK WEST Rx : EUROPE L/P											
UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5		UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5		UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5			
1	10.4	1.9	7.9	10	6	-26	...	...	...	1	20.7	14	15.6	22	18	13	2	-7	...	...	1	14.3	1	10.0	1	2	-2	-12	-23	...	
2	12.1	14	7	9	-27	...	...	...	...	2	21.2	14	15.9	23	20	14	4	-8	...	...	2	13.7	4	8.6	5	2	-4	-15	-31	...	
3	13.1	13	9.7	12	3	-8	-24	...	...	3	21.3	15	15.9	24	21	15	5	-7	...	...	3	13.1	8	9.3	8	2	-5	-19	-34	...	
4	18.7	13	14.4	15	13	8	0	12	...	4	21.1	16	15.8	27	22	15	4	-8	...	...	4	12.7	10	9.0	10	2	-7	-22	...	...
5	22.9	9	18.4	8	12	11	5	3	...	5	20.7	14	15.6	22	18	13	2	-7	...	...	5	12.6	12	9.0	10	2	-8	-28	...	...
6	23.6	8	19.0	6	12	11	7	0	...	6	17.1	22	13.4	33	21	0	0	-7	-26	...	...	6	13.2	14	9.5	13	5	-5	-20	-37	...
7	22.8	6	18.3	5	11	10	5	-2	...	7	15.8	25	11.9	30	15	0	20	...	...	...	...	7	14.5	15	10.5	15	8	0	-13	-27	...
8	21.2	9	17.0	8	11	9	0	6	...	8	13.9	27	10.5	26	7	-11	-36	...	...	...	...	8	16.3	15	11.8	16	12	5	-17	-20	...
9	18.4	2	15.3	10	11	7	-1	-12	...	9	12.9	32	6.2	19	4	-28	...	...	...	...	...	9	16.9	12	12.9	11	2	-3	-7	-20	...
10	17.0	10	13.4	11	9	2	-8	-22	...	10	10	31	6.2	13	14	...	...	...	...	...	...	10	14.7	7	11.4	7	3	-4	-16	-30	...
11	14.8	11	11.6	11	5	3	-18	35	...	11	10.1	31	7.5	6	-25	...	...	...	...	...	...	11	12.7	0	9.8	2	-2	-10	-23	-38	...
12	15.0	10	11	12	11	5	3	6	...	12	9.5	32	7.0	1	-32	...	...	...	...	...	...	12	11.4	7	10.6	7	-1	-5	-13	-26	...
13	11.5	16	8.9	10	5	...	...	...	...	13	9.1	33	6.7	-2	-39	...	...	...	...	...	...	13	10.6	14	8.1	3	-6	-13	-26	...	...
14	10.8	22	8.3	10	-10	-29	...	...	...	14	8.9	33	6.6	-4	...	...	...	...	...	...	...	14	10.2	-20	7.7	4	-5	-12	-24	-39	...
15	10.4	28	7.9	10	13	-35	...	...	...	15	8.9	33	6.6	-4	...	...	...	...	...	...	...	15	10.0	-39	7.8	15	-14	-20	-33	...	...
16	10.2	28	7.7	9	15	-38	...	...	...	16	8.4	34	6.5	-8	...	...	...	...	...	...	...	16	9.8	9	7.5	-22	-20	-26	-39	...	...
17	10.0	29	7	9	-16	...	...	...	...	17	8.2	35	6.3	10	...	...	...	...	...	...	...	17	9.8	7	7.5	-28	-25	-31	...	...	...
18	9.8	30	7.6	8	18	...	...	...	...	18	8.0	34	6.1	-14	...	...	...	...	...	...	...	18	9.4	7	7.3	-35	-32	-38	...	...	...
19	9.5	30	7.4	5	-22	...	...	...	...	19	8.1	32	6.3	-13	...	...	...	...	...	...	...	19	8.9	7	7.0	-38	-35	-41	...	...	...
20	9.1	31	7.1	3	26	...	...	...	...	20	9.7	24	7.6	1	-27	...	...	...	...	...	...	20	9.1	7	7.2	-34	-32	...	...	...	...
21	9.4	30	7.4	5	-22	...	...	...	...	21	12.8	19	9.9	15	-2	-20	...	...	...	...	...	21	10.7	-35	8.0	-15	-12	-17	-27	...	...
22	9.8	31	7.6	8	-17	...	...	...	...	22	16.0	16	12.3	20	10	1	-18	-37	...	...	...	22	15.6	-12	10.8	10	-4	-6	-13	-23	...
23	9.3	29	7.3	5	-22	...	...	...	...	23	18.5	15	14.1	21	16	7	5	21	...	...	...	23	15.9	-5	11.2	-10	2	-2	-7	-15	...
24	9.5	24	7.5	5	-18	...	...	...	...	24	19.8	14	15.0	22	18	11	0	-14	...	...	...	24	15.0	-3	10.5	-5	0	-2	-9	-18	...

Tx : VK SOUTH Rx : ASIA										Tx : VK SOUTH Rx : USA/CARIBBEAN										Tx : VK WEST Rx : MEDITERRANEAN											
UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5		UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5		UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5			
1	22.0	9	18.8	7	12	10	5	-3	...	1	26.8	8	20.8	-7	6	9	2	28.5	...	...	1	14.7	19	11.2	18	10	0	-15	-33	...	
2	22.0	9	18.8	7	12	10	5	-3	...	2	26.8	8	20.8	-7	6	9	2	28.5	...	...	2	14.7	19	11.2	18	10	0	-15	-33	...	
3	23.3	9	17.8	5	12	11	7	0	...	3	25.7	14	19.8	14	19	15	9	...	...	...	3	17.4	7	13.7	3	7	3	-4	-14	...	
4	23.3	9	17.8	5	12	11	7	0	...	4	23.8	18	19.0	25	25	22	17	10	...	...	...	4	21.7	7	18.5	-2	7	7	4	-1	...
5	23.7	10	17.0	13	13	12	6	-1	...	5	22.8	20	18.0	32	29	24	16	7	...	...	...	5	24.3	8	18.9	7	4	7	5	0	...
6	25.1	10	17.0	13	13	12	6	-1	...	6	21.8	20	10.3	35	29	22	12	1	...	...	...	6	24.3	5	18.4	-10	3	6	4	0	...
7	21.1	11	16.0	14	15	11	4	-5	...	7	18.9	22	14.2	34	25	18	3	-10	...	...	...	7	24.2	8	18.3	-10	2	5	4	-1	...
8	19.2	14	14.5	20	18	9	-1	-15	...	8	18.3	25	12.2	31	19	7	-9	27	...	...	...	8	23.7	9	17.8	-10	3	5	4	-1	...
9	18.4	16	14.5	20	18	9	-1	-15	...	9	18.4	25	12.2	31	19	7	-9	27	...	...	...	9	23.7	9	17.8	-10	3	5	4	-1	...
10	14.8	21	11.0	22	8	-10	-32	...	...	10	12.5	27	10.4	26	11	-4	-24	...	...	...	...	10	22.5	5	17.0	-7	4	5	2	-3	...
11	14.8	21	11.0	22	8	-10	-32	...	...	11	10.1	31	7.5	6	-25	...	...	...	...	...	...	11	20.8	5	15.8	-1	6	5	2	-3	...
12	11.4	23	8.9	8	-19	...	...	...	...	12	11	11	7	1	-11	-36	...	...	...	...	...	12	12.5	15	9.5	-15	-11	-16	-38	...	...
13	10.7	25	8.0	3	-19	...	...	...	...	13	11.2	29	8.2	16	-5	-26	...	...	...	...	...	13	12.0	8	10.1	8	6	-1	-13	-27	...
14	10.7	25	8.0	3	-19	...	...	...	...	14	10.1	31	7.5	6	-25	...	...	...	...	...	...	14	14.0	11	10.8	11	2	-8	-25	...	...
15	10.0	25	7.6	3	-37	...	...	...	...	15	11.2	29	8.2	16	-5	-26	...	...	...	...	...	15	12.5	15	9.5	-15	-11	-16	-38	...	...
16	10.0	25	7.6	3	-37	...	...	...	...	16	10.1	31	7.5	6	-25	...	...	...	...	...	...	16	11.1	11	10.8	11	2	-8	-25	...	...
17	10.0	25	7.6	3	-37	...	...	...	...	17	10.6	3	8.0	4	-7	-21	...	...	...	...	...	17	11.1	24	8.5	12	-9	-13	-25	...	...
18	9.8	28	6.7	-18	...	...	...	...	...	18	9.9	8	7.1	1	-11	-36	...	...	...	...	...	18	11.1	15	9.5	-15	-11	-16	-38	...	...
19	9.8	28	6.7	-18	...	...	...	...	...	19	10	10	7	7	-1	-7	-18	...	...	...	...	19	11.0	27	8.2	11	12	-35	...	...	...
20	9.5	28	6.8	-17	...	...	...	...	...	20	12.1	18	8.9	-2	-3	-9	-22	-37	...	...	...	20	10.9	28	8.3	11	13	-38	...	...	...
21	9.4	28	6.8	-17	...	...	...	...	...	21	16.2	4	12.5	-6	0	-1	-8	-18	...	...	...	21	20	10.3	28	7.8	8	1	30	...	...
22	9.4	28	6.8	-17	...	...	...	...	...	22	13.5	3	15.6	-10	3	0	2	...	...	...	...	22	23	10.3	28	7.8	8	1	30	...	...
23	9.4	28	6.8	-17	...	...	...	...	...	23	22.5	4	17.9	-15	0	4	3	0	...	...	...	23	22	9.3	29	7.2	0	31	...	...	...
24	9.5	24	7.5	5	-18	...	...	...	...	24	26.2	6	19.0	15	0	5	5	2	...	...	...	24	23	15	27	8.6	15	-8	-29	-7	...

Tx : VK SOUTH Rx : EUROPE L/P										Tx : VK WEST Rx : AFRICA										Tx : VK WEST Rx : SOUTH PACIFIC										
UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5		UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5		UTC	MUF	dBu	FOT	14.2	18.1	21.2	24.9	28.5		
1	14.3	1	11.0	1	8	2	-8	-22	...	1	9.5	25	7.3	6	-18	...	...	...	...	...	1	24.3	1	18.4	14	18	15	10	2	...
2	14.1	1	10.8	14	6	0	-12	-26	...	2	9.8	18	7.5	6	-13	-33	...	...	...	...	2	25.4	1	19.1	14	18	17	12	4	...
3	13.6	8	9.5	15	13	8	-17	-34	...	3	15	16	8.6	12	12	-10	-26	...	...	...	3	26.3	2	19.6	12	18	14	10	6	...
4	13.1	21	9.2	19	8	4	-21	-31	...	4	15.8	12	14.3	14	13	7	-2	13	...	...	4	26.0	1	19.5	18	21	19	13	8	...
5	12.9	25	9.2	22	8	4	-23	-34	...	5	22.5	10	17.1	18	13	11	5	-2	...	...	5	25.7	13	19.3	22	23	20	14	6	...
6	13.6	24	9.7	25	10	4	-18	-37	...	6	23.8	14	18.1	23	18	11	9	-3	...	...								

Silent Keys

Due to increasing space demands obituaries should be no longer than 200 words.

The WIA regrets the passing of:		
H (Harry)	Cuthbert	ex-VK2AEC
TJT (Tom)	Stroud	VK2AMR
R (Russell)	King	VK2ARR
LW (Lay)	Cranch	VK3CF
CJ (Clive)	Cooke	VK4CC
GA (George)	Kirkgaard	VK4GK
RL (Robert)	Bridge	VK4NDV
P	Clafton	VK5EH
GF	Massey	VK6GF
JE (Ted)	Godley	VK6JG

OBITUARY

Thomas Stroud VK2AMR

Tom peacefully passed away on 5 February 1993 after a short illness.

Tom, more formally Thomas James John Stroud, was born 3 May 1905 in the house next door to where he later built his own home, and where he lived for the majority of his life with wife Mary (Mop) and their six children.

Tom left school at the age of 13, and worked with his father as a house painter. In the 1930s, with painting jobs hard to find, Tom answered a newspaper advertisement for a salesman to sell "Eson" radios.

A new interest was born, and Tom soon mastered the repair of radios. His enthusiasm soon spread to amateur radio and, after a lot of reading and experimenting, Tom obtained his amateur licence in 1939.

Tom's other interests ranged from furniture making, including meticulously designed grandfather clocks, to set designing for the Wesley Players Theatrical Group.

My first introduction to Tom was in 1949 when I became interested in AR, and with many others will be forever grateful for the assistance and friendship given by Tom. Tom was an enthusiastic RD contestant and will be sadly missed on the air.

Tom is survived by his six children, 12 grandchildren and seven great-grandchildren. Sadly missed by all.

Eric Piraner VK1EP

George Allan Kirkgaard VK4GK

Many amateurs will be saddened to hear of the passing of George Kirkgaard on 18 December 1992 at the age of 71 years.

George served with the RAAF during WWII as a member of 100 Squadron and continued his interest and study into radio for the rest of his life. For a time after the war he worked as a technician with broadcasting stations 4GY Gympie and 4BU Bundaberg. Following this experience he moved to the broadcasting section of the PMG Department, and then into the radio branch as a radio inspector. For many years George was responsible for the interference section of the radio branch, and the final position he held with this organisation before retiring was that of state manager.

George had a special expertise in interference problems, and his ideas were often sought after. He was willing to share his knowledge and expertise with many organisations — including the WIA — as a lecturer.

George moved to Tewantin in his retirement.

However, ill health hindered his intention of becoming more active in the hobby of amateur radio.

Our sincere sympathy to his wife Dorothy, daughter Christine, and son Barry.

Les Brennan VK4XJ

Lay Cranch VK3CF

Lay Cranch, widely known throughout Australia as VK3 Charlie Foxtro, passed away on Tuesday 30 March.

Lay was born in Cairns in October 1910, and came to Melbourne when still a boy.

He studied electrical engineering and was apprenticed to FL Cook & Williams (Ringrip), and became interested in radio as a hobby. He passed his amateur operator's exam at the age of 15, but regulations at the time did not allow the issue of a licence before the age of 18. However, he was given permission to operate with his friend Bill Seifers VK3CB, and they were well known for their operations on 200 metres and other bands. Although denied an amateur licence, Lay was granted an experimental licence which allowed him to operate on any frequency at all, and he held this as VK3T until his passing.

His long career in radio started about 1929 when his boss at Ringrip dismissed him with a month's pay and told him he should look for a job in radio, but that he could have his job back if he failed to get a job in radio. From there on his career reads like a history of the radio

industry in Australia. Brashes, Firth Bros, Radio Vision, Essanay, Crown Radio and Kingsley Radio to name some.

During the war years he was at Crown Radio in Sydney, and served in small ships as an officer in the RANVR. He was a member of the Institute of Radio Engineers, the WIA, a foundation member of the Radio Amateurs Old Timers Club, and the Moorabbin & District Radio Club.

He will be greatly missed by his wife Mayzie, his family and countless friends.

Allan Dobie VK3AMD

For Radio Amateurs Old Timers Club and Moorabbin & District Radio Club

Ted Godley VK6JG

Ted died suddenly on the 29th March 1993 at Greenough near Geraldton WA.

Ted was a licensed electrician for many years in Bunbury and other country districts. He worked hard in Darwin restoring power after Cyclone Tracy. He was a practical ham, licenced early in post WW2 years and, using fairly basic equipment, worked the world in general and VK6 in particular.

For several years, he travelled around Australia and operated on 14 MHz using a mini beam on top of his caravan, ingeniously lowered or raised as required. A kindly modest operator who gave freely of time and advice, and actively assisted friends into amateur radio.

Over many years he was to be found on forty metres where he is sadly missed.

Deepest sympathy to his wife Win and family.

Lee Hitchins VK6HC

ar

The Origin of "HAMs"

Bill Yates VK3SB

This article originally appeared in "Florida Skip" in 1959, and has been reproduced over the years by other amateur radio clubs.

Have you ever wondered why radio amateurs are called "hams"? Well it goes something like this.

The word "HAM" as applied in 1908 was a station call of the first wireless station operated by some amateurs at the Harvard Radio Club. They were Albert S Hyman, Bob Almy and Poozie Murray.

At first they called their station "Hyman-Almy-Murray". Tapping out such a long name in code became tiresome and called for a revision. They changed it to "Hy-Al-Mu", using the first two letters of each of their names.

Early in 1909 some confusion resulted between signals from amateur wireless station "Hyalmu" and a Mexican ship named "Hyalmu". They then decided to use only the first letter of each name, and so the station call became "HAM".

In early pioneer days of unregulated radio, amateur operators picked their own frequency and call letters. Then, as now, some amateurs had better signals than commercial stations.

The resulting interference came to the attention of Congressional Committees in Washington, and Congress gave much time to proposed

legislation designed to critically limit amateur radio activity.

In 1922, Albert Hyman chose the controversial "Wireless Regulation Bill" as the topic for his thesis at Harvard. His instructor insisted he send a copy to Senator David I Walsh, a member of one of the committees hearing the bill.

The Senator was so impressed with the thesis he asked Hyman to appear before the committee. Albert Hyman took the stand and described how the little station was built. He almost cried when he told the crowded committee room, that, if the bill went through, they would have to close down the station because they could not afford the licence fee and all other requirements which the bill imposed on amateur stations.

Congressional debate began on the Wireless Regulation Bill, and the little station "HAM" became the symbol for all the little amateur stations in the country crying to be saved from the menace and greed of the big commercial stations which didn't want them around. The bill finally got to the floor of Congress and every speaker talked about the "... poor little station HAM".

So that's how it all started. You will find the whole story in the Congressional record. National publicity associated the station "HAM" with amateur operators.

ar

HAMADS

TRADE ADS

● **AMIDON FERROMAGNETIC CORES** For all RF applications. Send business size SASE for price list to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please) 14 Boanyo Ave (Kiama) Agencies at Geoff Wood Electronics, Sydney Webb Electronics, Albany Assoc TV Service, Hobart Truscotts Electronic World, Melbourne.

● **WEATHER FAX** programs for IBM XT/ATs *** "RADFAX2" \$35-00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder *** "SATFAX" \$45-00, is a NOAA, Meteor and GMS weather satellite picture receiving program Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver *** "MAXISAT" \$75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add \$3-00 postage. ONLY from M Delahunt, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

● **SHACKLOG V3** the PC logging system. Real time QSO logging, DXCC needs alert, QSL labels, log control, database analysis, reports etc. Simultaneous packet operation. Optional on-line IOTA database (G3KMA). Plus lots more! 2750 inc comprehensive manual. Air mail 700 SASE for full details to G3PMR, 30 West Street, Gt Granston, SANDY, S919 3AU, UK. (Note: Prices are in Pounds Sterling).

FOR SALE ACT

● **DRAKE TR7 HF xcvr**, gen cov rx, S/N 10431, fan, ext VFO, desk mic, manuals, all filters, ex cond, \$950 ONO; Richard VK1RJ (06) 258 1228.

FOR SALE NSW

● **ROBOT 400 \$380**; **TELERADER CWR-865A** (updated software), \$550; additional AMTOR board \$100; **TNC200 Packet Radio board**, \$180; **SONY ICF-2001** gen cov rx, \$240; **OLIVETTI M-24** computer, \$300, **TOM, VK2OE**, (046) 21 2228.

● **YAESU MUSEN mobile FT7 HF xcvr**, mic, manual, \$300, **PSU 240/13.5 V**, 100; both ex cond **Freda VK2SU QTHR** (069) 68 1556.

● **DECEASED ESTATE** of the late Russell King **VK2ARR** ICOM IC761 HF xcvr (s/n 03496) with voice freq readout, inbuilt ATU, hand mic, manual, VGC, \$3000, **KENWOOD TS630S HF xcvr** (s/n 1070194) incl remote VFO-230, spare final and driver tubes, cw filter \$600; **KENWOOD VHF FM xcvr TR-7950** (s/n 3071088) \$500; **DM81 dip meter**, \$150; **DUMMY load RD 300**, \$100, **AT-200 ATU**, \$150, **MC50 mic**, \$50; **SPEAKERS SP-940** 70, **SP-930** (new) \$100, **WELZ PSU RS-3050**, \$350; **DUMMY load CT-15A**, \$25; **DATONG Morse tutor D-70**, \$200, **YAESU VHF h/weld FT208R**, \$200, **YAESU remote VFO FV107**, \$150; **BENCHER twin-paddle key**, \$125; **DAIMA keyer**

DK210, \$75; **CN-520 SWR/PWR meter**, \$50; **AKIGAWA swr/pwr meters** APM-IH & APM-IV, \$50 ea; **Quality home brew ATU**, \$200; **KEYBOARD CW generator**, \$90. Assorted useful bits & pieces incl LP filters, DOG-BONE TV feeder, roller inductors, variable capacitors, coax, ham text books etc. Enquiries to Kevin VK2DYW QTHR (02) 44 3279.

● **DECEASED ESTATE** - **NALLY 13.7m** tilt over tower in GC, **HY-GAIN 203BA** 20m mono band antenna, **HAM 2CD44** rotator and control, \$1100, purchaser to remove; enq to **Rolly VK2GFO QTHR** (044) 74 3361.

● **ICOM 2m FM IC28A 5/25 W mobile s/n 15974**, \$370; **AEA PK232MBX multimode controller**, s/n 24123, all cables, manuals & software incl, \$400, **DIAMOND F23A 3 x 5/8 2m vertical antenna**, \$140; all equipt in vy good cond. Sell the lot for \$800. **Tony VK2FCO** (02) 807 6187.

FOR SALE VIC

● **ICOM IC551 6m rig** with PBT/Speech proc and FM options, \$425 ONO; **Chas VK3BRZ** (052) 82 3167.

● **DECEASED ESTATE** of the late **VK3BR**. Most of this equipment is brand new and unused **ICOM IC-2KL Linear** with **PSU**, \$1800; **ICOM AT-500 Auto ATU**, \$500; **HEATH Antenna**, 1 kW dummyload, \$50; **ICOM SM-6 desk mic**, \$80; **ICOM SM-8 desk mic**, \$100; **DRAKE 1 kW low pass filter**, \$60; **JOHNSON Matchbox ATU**, ex cond, \$200, **ICOM RC-10 remote freq ctrl** for **IC-751 HF xcvr**, \$50, **ICOM IC-2AT 2m FM HH** with spkr mic & BC-36 fast charger, \$275; **KYORITSU SWR meter**, ex cond, \$20, **QB300 linear tubes** with sockets, \$50; **DOWKEY coax relays**, 2 pos, \$25, 3 pos \$50; **NATIONAL NCX-3 80/40/20 SSB xcvr**, 1980s vintage, incl **PSU**, ex cond, collectors item, \$200, **PALOMAR antenna** nose bridge, \$75, **BC-221 freq meter**, **VW2 vintage** with **AC PSU**, all in good order, \$25; **DATONG woodpecker blander**, \$20, **REALISTIC AM Stereo BC Tuner**, \$40, **MARCONI 995 A/S** sig gen, covers 1.2 - 220 MHz, good cond, \$200; **BUTTERNUT HF6B** with 160m coil, \$200. All the above prices are open to offers. There are also many items not listed. Give me a ring, I might have what you want. Contact **Ron, VK3OM QTHR** (059) 44 3019.

● **REALISTIC HTX100 10m mobile** with ZCG mobile antenna, ex cond, \$200; **Derek** (03) 730 1557.

● **YAESU HF linear** model **FL2500**, 1 kW, 10m to 160m, updating, 2 spare final tubes, \$200-00; **VK3WIM QTHR** (03) 808 2180.

● **ICOM IC-751A HF xcvr**, S/N 03746, manuals, \$1600-00, **Dave VK3DNG QTHR** (03) 859 4696.

● **MODE B SATELLITE EQUIP**; **TEN-TEC 1510 Satellite** s/n, 435/45 MHz; **HEPUBURN 145 MHz** converter; **DAIMA UHF LA-4090 UHF** lin amp; **ZV SA270 antenna** package 145 & 435 covered Yagis with boom & coax lead-ins; **KEMPRO ElevAzim** rotator with **KR5400 controller** & lead-ins; **WELZ SWR/PWR meter SP-420**, \$1,500 the lot, ONO, or will sell

separately (\$2500 value), all in mint cond with manuals, ready to go. **Alf Chandler VL3LC QTHR** (03) 589 5344.

● **COLLINS S line equip**; **75S3B receiver**, **32S3 transmitter** incl **PSU**, ex cond, manuals incl, \$1,000-00; **COLLINS 390A rx**, ex cond, \$1,000-00. **Rob VK3UE** (060) 37 1262 **OR** (03) 584 5737.

● **420-440 MHz professional built Yagis** (two), \$120 the pair, 420-440 MHz matched dipoles with phasing harness, \$50-00; one pair **PHILIPS SXA UHF** portables, 470 MHz with desk top charger, \$200-00; **VK3KFC QTHR** Tel (059) 96 3580.

● **TOKYO HY-POWER linear HL-2K**, 2 kW input, incl **WARC bands**, pair **3500Z** in finals, ex cond, little use with packaging, \$2000-00 **ONO**. **Ray VK3CDR QTHR** (03) 728 9222.

● **SHACK CLEARANCE**, **YAESU FT227R 2m FM**, single memory, **port offsets**, 10 W, m.c. manual, ex cond, \$250; **ICOM IC280A 2m all mode mobile**, 3 m.c.s, dual **VFOs**, 10 W, no mobile use, m.c. manual, ex cond, \$550-00; **ALINCO 2m lin amp**, model **ELH-230G**, all mode op, 200 mW to 5 W input for up to 30 W output, ideal for **FT290R** or any h/held, c/w mounting bracket, manual, ex cond, \$120-00; **AWA NOISE & Distortion meter** model **AS1932**, c/w manual & few spare valves, fair cond, \$40-00; **DUPONT LABORATORIES Oscillograph** model **304H**, ideal as s/n monitor, vy good cond, c/w spare CRT tube, \$50-00. **Rob Hailey QTHR** (03) 758 1713.

FOR SALE QLD

● **TE-13 ROTATABLE** multiband dipole, \$120-00 **ONO**, **Peter VK4GPs** (075) 39 4465.
● **YAESU FRG7000** with tuner, \$480;
● **NATIONAL DR59 rx**, \$220, **SCANNERS** - **REALISTIC PRO-2003** 180, **BEARCAT 350**, best offer. **Ron VK4BL QTHR** (070) 55 0230.

FOR SALE SA

● **YAESU FTDX400 250W HF xcvr**, ex cond, recently fitted new Toshiba valves, 2nd owner, orig man, S/N 5053928, \$275 neg; **VIC 20 computer** with **CWRTTY** cartridge, used for Morse trainer, ideal for higher code speed from 5 to 10 WPM, useful accessories, S/N 194959, \$60 **ONO**; **Dean VK5LB QTHR**, (085) 56 8101.
● **DECEASED ESTATE** - **YAESU XCVR FT767GX** with books and **MD1 mic**, pristine cond, S/N 6M070912, offers; contact **Bob VK5QJ**, 7 Hewitt Av, St Georges 5064, or (08) 379 1845.

● **YAESU FL2100Z linear amp**, S/N 180081, little use, top cond, \$650; **EMTRON EAT300 ATU**, co-ax, tuned feeders, long wire, \$80; **Murray VK5BV QTHR** (087) 38 0000.

FOR SALE WA

● **YAESU FT1012D xcvr**, VGC, **YAESU FL2100B linear amp**, 1200 W, VGC, priced to sell, \$900 the lot **ONO**, will consider splitting \$450 each, **BOB VK6DH** (09) 527 3924.
● **INFO TECH RTTY MORSE** equip, comprising keyboard, demodulator, **VDU**, perf cond, \$350-00 the lot. **Albert VK6UA QTHR** (09) 535 4360.

55

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING AND PRINTING:

Industrial Printing, 122 Dover Street, Richmond, 3121. Telephone: 428 2958

MAIL DISTRIBUTION:

R L Polk & Co Pty Ltd, 96 Herbert St, Northcote, Vic. 3070. Tel: (03) 482 2255

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. \$4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at \$2.50 each (plus \$2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

ADVERTISERS INDEX

Amateur Radio Action	17
ATN Antennas	9
Dick Smith Electronics	31
Dick Smith Electronics	IBC
Electronic Disposals	33
ICOM	OBC
Jenlex Filters	35
Kenwood Electronics	IFC
Stewart Electronics	5
WIA Divisional Bookshops	25
WIA Federal	56
WIA NSW Division	18
Trade Hamads	
RJ & US Imports	54
M Delahunty	54

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

Call Sign (if applicable):.....

Address:.....

State and Postcode:.....

VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

- VK1 GPO Box 600 Canberra ACT 2601
- VK2 PO Box 73 Teralba NSW 2284
- VK3 40G Victory Boulevard, Ashburton VIC 3147
- VK4 GPO Box 638 Brisbane Qld 4001
- VK5 PO Box 10092 Gouger Street Adelaide SA 5000
- VK6 GPO Box F319 Perth WA 6001
- VK7 GPO Box 371D Hobart Tas 7001
- VK8 C/o H G Andersson VK8HA Box 619 Humpty Doo NT 0836
- VK9/VK0 C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

Solution to Morseword No 74

Page 55

	1	2	3	4	5	6	7	8	9	10
1
2
3
4
5
6
7
8
9
10

Solution to Morseword 74

Across: 1 Dry; 2 Axes; 3 Care; 4 Stain; 5 Mask; 6 Dots; 7 Doer; 8 Odes; 9 Year; 10 Hike.
Down: 1 Come; 2 Raid; 3 Pip; 4 Smote; 5 Dub; 6 Jade; 7 Brat; 8 Ices; 9 Tidy; 10 Dais.



Simplicity.

Why complicate your life when the simple things work so well? The new FT-26 from Yaesu is an excellent example of an easy to use, comfortable to hold, yet highly functional 2m handheld which you'll love to own. The specially designed Australian version microprocessor provides all the specialised features you'll ever need, yet keeps many 'set and forget' functions in the background where they belong. What's more, well laid out controls, rugged polycarbonate and diecast casings and a low distortion speaker ensures you'll enjoy using your FT-26 for many years to come.

- 144-148MHz transceive operation (better than 0.158uV sensitivity, 2W RF output), with highly sensitive wideband receiver coverage (130-174MHz) as standard
- Custom microprocessor provides Australian version Auto Repeater Shift (ARS) for the easiest repeater operation, plus 53 tunable memories and 6 selectable tuning steps.
- A concise instruction manual with photographs and diagrams which takes you through all areas of operation.
- Each FT-26 comes with a superb long-life 7.2V 700mA/H NiCad pack as standard!
- An external DC jack and inbuilt battery charge circuit allows direct 12V DC operation, and 5W output.
- Yaesu's unique Automatic Battery Saver monitors operating history and optimises the save duration to stretch your operation time.
- 3 selectable output power levels (4 on 12V) provide greater flexibility
- Inbuilt VOX circuitry allows hands free operation (with optional YH-2 headset)
- Inbuilt DTMF paging provides group or selective calling facilities
- Rubber gasket seals provide protection from the elements
- Backlit 6 digit LCD screen and illuminated front panel buttons for night time operation
- Complete with 700mA/H NiCad, beltclip, protective carry case, a carry strap, antenna and approved AC charger.
- Ultra Compact: 85(w) x 125(h) x 33(d)mm.

2 YEAR WARRANTY

Introductory Price

Cat D-3600

\$399



YAESU

'Quality and Reliability
You Can Afford'



IC-765

Our Base Units Have So Many Features, These Pictures Speak Louder Than Words.



IC-781

Our features speak volumes. Rather than write hundreds of words to introduce our range of base units, we'd like you to phone us free on (008) 338 915. We'll provide you with detailed brochures

and the name of your nearest authorised Icom dealer.

Alternatively, you can write to Reply Paid 1009 Icom Australia Pty Ltd P.O. Box 1162 Windsor Victoria 3181. Telephone (03) 529 7582 A.C.N. 006 092 575